

[COMMITTEE PRINT]

LEGISLATIVE COUNSEL

FILE COPY

THE CHANGING STRATEGIC MILITARY
BALANCE
U.S.A. vs. U.S.S.R.

Prepared at the Request of the
COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
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FIRST SESSION, NINETIETH CONGRESS

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LETTER OF TRANSMITTAL

MEMBERS, HOUSE COMMITTEE ON ARMED SERVICES

TO THE MEMBERS: The problem of whether the United States has sufficient nuclear weapons to meet the Soviet threats underlies our entire defense posture.

In order to better understand the situation I requested the American Security Council to examine the situation on the basis of unclassified statements in the open literature. The report "The Changing Strategic Military Balance" is the result of that study. This report is being presented as a Committee Print in order to be available for all so that they may see what is involved in our present situation.

I must express my appreciation for the work involved in preparing this study to John Fisher, President of the American Security Council, and to General Bernard A. Schriever, USAF (Ret.), who chaired the special subcommittee responsible for this particular study. I would like also to express my appreciation to the Aerospace Technology Division of the Legislative Reference Service in the Library of Congress for its part in the research on which the report is based.

While the Committee on Armed Services does not take any position as to the accuracy of the statements contained in the report and can neither affirm nor deny the whole or any portion, I believe, nevertheless, that the report deserves careful analysis. The views expressed in this study do not necessarily represent the views, however, of myself, this Committee, individual members, or the staff.

L. MENDEL RIVERS,
Chairman.

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FOREWORD

This study has been prepared for the House Armed Services Committee at the request of Committee Chairman L. Mendel Rivers. He asked that we prepare an assessment of the strategic military balance between the U.S.A. and the U.S.S.R. based *on unclassified sources only*.

To insure availability of the full range of public source material, Chairman Rivers asked the Library of Congress to assist in this study. This assistance was provided by the Aerospace Technology Division of the Library of Congress. We gratefully acknowledge this help which included reviewing a great volume of material for pertinent references, compiling the results of this review, and providing office space and other facilities for American Security Council staff personnel.

It is fully realized that in using unclassified sources of information only, much of the data used could be inaccurate. However, the same can be said for the most carefully gathered secret intelligence. Opportunities for factual verification of intelligence information concerning the U.S.S.R. do not come very often. Informational "raw material" must be evaluated and interpreted before it becomes functionally meaningful. The element of human judgment is predominant in these processes and a wide range of fallibility inevitably results.

Some of the figures used so freely in classified quantifications fail to receive a unanimous vote by the principal intelligence officers involved, but a decision must be made and so the majority prevails. One must ever keep in mind that a belief by a majority that something is so does not make it a fact, and factual verification is often difficult, if not impossible.

Thus the Soviet installation of missiles in Cuba came as a complete surprise to official Washington despite the massive preparations which had extended over several months. Similarly, there are current differences within the Department of Defense as to whether the primary purpose of the great Soviet TALLINN defense system is to defend against bombers or against missiles.

This study is based on analysis and evaluation of hundreds of unclassified sources published from January 1960 through April 1967. The types of sources used ranged from military, nuclear-strategic, and

and technical journals and magazines, and publications of general and popular circulation, news magazines and newspapers.

Some of the more productive sources for strategic balance specifics included testimony before Congressional Committees by Secretary of Defense McNamara and other Department of Defense officials, *The Military Balance* by London's Institute for Strategic Studies, *Jane's All The World's Aircraft*, *Jane's Fighting Ships*, *Technology Week*, *Air Force Magazine/Space Digest*, *Aviation Week and Space Technology*.

Certain of the articles reviewed were "landmarks" or "break-throughs" in their contribution to the unclassified literature bearing upon the strategic military balance. The following six articles are in that category:

"Is Russia Winning the Arms Race?" *U.S. News & World Report*, February 6, 1967.

"The Russians Mean to Win the Space Race," by William Shelton, *Fortune*, February 1966.

"Countdown For Nike-X," by George A. W. Boehm, *Fortune*, November 1965.

"Slow-Down in the Pentagon," by Hanson W. Baldwin, *Foreign Affairs*, January 1965.

"The Atomic Arsenal," (Cover Story)—*Time*, August 23, 1963 (Reprinted in *Readers Digest*, November 23, 1963, p. 67 under title "Our Awesome Atomic Arsenal").

"Now the President Must Decide on His Own," by Charles J. V. Murphy, *Life*, February 16, 1962.

We believe that sources such as those noted are responsible although it should be understood that their resources do not compare with those available to the United States intelligence community. We do believe that the "ball park" figures from these unclassified sources are adequate to support thoughtful evaluation, and that they will indicate trends and strategic postures which could not otherwise be revealed.

In reporting specifics which have come from a variety of sources, we have listed the source or sources most readily available to the general public.

For purposes of this study, strategic weapon systems are considered to be forces designed to carry out long-range strategic missions and to carry the main burden of battle in a general nuclear war.

In this study we have used the same ground rules throughout for comparison of weapon systems. We have compared *like* kinds of weapons, i.e., ICBMs with ICBMs, IRBMs/MRBMs with their like, strategic bombers with strategic bombers, and submarine-launched missiles with submarine-launched missiles. Not only are numbers compared, but

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also the yield of the nuclear warheads. Those with access to classified information may readily make the necessary data substitutions should this be desired.

In assessing the strategic military balance we have considered both the number and yield of each strategic weapon system. Each of these is an important measure, but we fully agree with Secretary McNamara when he says, "... We should bear in mind that it is not the number of missiles which is important, but rather the character of the payloads they carry; the missile is simply the delivery vehicle."¹ For this reason, we use the payload as the best single measure of the strategic military balance. After all, weapons-yield as expressed in megatonnage is the measure of firepower in the nuclear age.

In this connection, it should be noted that in our classification of strategic weapon systems we have paralleled the scholarly Institute for Strategic Studies classification system. There are material differences between this approach and that used currently by the Office of the Secretary of Defense (OSD).

For example, in his January 23, 1967 Posture Statement, Secretary McNamara did not consider the 900-odd Soviet BADGERs in the strategic balance. Yet, the BADGERs have intercontinental range with in-flight refueling and are so classified by the Russians. The BADGER is comparable to the phased-out B-47, which was previously included in the strategic forces by the Office of the Secretary of Defense. Their range is as long as the FB-111 which the OSD plans to use as a "strategic bomber."

Secretary McNamara does not consider the 750 intermediate-range ballistic missiles based in western Russia as a part of the strategic force even though they could eliminate the major defenses and cities of our NATO allies. These IRBMs are supposed to be countered by the United States submarine-launched IRBMs (POLARIS), but when comparing opposing forces, the OSD groups the POLARIS missiles with ICBMs.

Both the BADGERs and the IRBMs in Western Russia are classified as "strategic" by the Institute for Strategic Studies. We concur with this judgment.

It would be short-sighted, however, not to take into account the intentions of the Soviet leaders, for certainly it takes more than weapons to start a war. But history has revealed that the criterion of "intentions"

1. *Posture Statement* of Secretary of Defense Robert S. McNamara before a Joint Session of the Senate Armed Services Committee and the Senate Subcommittee on Department of Defense Appropriations on the 1968-72 Defense Program and 1968 Defense Budget, January 23, 1967, p. 41. (Hereafter referred to as *Posture Statement*, January 23, 1967.)

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is not as reliable as that of "capabilities" when preparing one's own defenses, for one might be deceived by intentions but never by capabilities provided his intelligence of the enemy is accurate.

If one is to examine an opponent's intentions, it is likewise important that he examine his own. The intentions of one side certainly influence the intentions of the other, not to mention the strategic stance each side takes with its weaponry. This criterion of intentions, or strategic objectives, has seemed to weigh heavily in the design of America's strategic military posture. For this reason, the strategic objectives of both sides are examined in the following section.

It should be emphasized that the purpose of this study is limited to a factual assessment and interpretation of the strategic military balance without arguing for, or against, the overall policies which have brought each side to its present strategic military posture.

signed/ General Bernard A. Schriever, USAF (Ret.),
Chairman

General Paul D. Adams, USA (Ret.)
Lt. General Edward M. Almond, USA (Ret.)
Prof. James D. Atkinson
Admiral Robert L. Dennison, USN (Ret.)
Vice Admiral Elton Watters Grenfell,
USN (Ret.)
General Curtis E. Le May, USAF (Ret.)
Admiral Ben Moreell, CEC, USN (Ret.)
Prof. Stefan T. Possony
General Thomas S. Power, USAF (Ret.)
Vice Admiral W. A. Schoech, USN (Ret.)
Major General Dale O. Smith, USAF (Ret.)
Admiral Felix B. Stump, USN (Ret.)
Dr. Edward Teller
Rear Admiral Chester C. Ward, USN (Ret.)
General Albert C. Wedemeyer, USA (Ret.)
Major General W. A. Worton, USMC (Ret.)

as special subcommittee of the
National Strategy Committee of the
American Security Council.

I. SOVIET UNION VERSUS UNITED STATES STRATEGIC OBJECTIVES

Trends in the Strategic Military Balance

I. SOVIET UNION VERSUS UNITED STATES STRATEGIC OBJECTIVES

Trends in the Strategic Military Balance

The basic frame of reference for comparing the strategic strength of the Soviet Union and the United States is an examination of their national objectives, both military and political. It is not our task here to explore Soviet political objectives *in extenso*, although it must be kept in mind that these cannot be separated from the U.S.S.R.'s military goals. For a half-century, Soviet leaders have time and again repeated that Communism's ultimate objective is world domination. But many in the Free World simply refuse to believe that the Soviet leaders mean what they say.

In the realm of strategic military weapons, the United States has, in recent years, demonstrated much the same inclination to disbelieve or to discount Soviet achievements and advances. This is particularly so with respect to the new ballistic missile defenses of the Soviet Union and to Soviet boasts of an orbital bomb capability.

Yet, the available evidence indicates that the Soviet Union has a goal of strategic superiority designed to *win* a nuclear war rather than merely *deter* one. Once in a war-winning posture, the U.S.S.R. would be ideally situated to practice nuclear blackmail and would not even have to fight a nuclear war. Some strategic analysts assert that this is the ultimate goal of the Soviet Union, and that it depends upon a defense against nuclear retaliation.

The United States has exchanged its goal of a war-winning strategic superiority for a strategy of mutual deterrence. The United States strategy of mutual deterrence is said to increase "stability" and reduce international tensions. Hence, American officials are striving to convince Soviet leaders that a race to build anti-ballistic missile (ABM) systems would be pointless.

Not only has the Soviet Union already deployed an ABM system, but much evidence indicates that it is driving hard toward a goal of overwhelming superiority in the decisive field of nuclear weaponry.

Contrast Between U. S. and Soviet Political Objectives

The thoughtful words of President John F. Kennedy clearly illustrate the contrast between U. S. and Soviet political objectives.

Regarding U. S. objectives, President Kennedy said:

"Yet our basic goal remains the same: a peaceful world community of free and independent states—free to choose their own

future and their own system, so long as it does not threaten the freedom of others."²

Regarding Soviet objectives, President Kennedy said:

"Where we feel the difficulty comes is the effort by the Soviet Union to communize, in a sense, the entire world. If the Soviet Union were merely seeking to protect its own national interest, to protect its own national security and would permit other countries to live as they wish—to live in peace, then I believe the problems which now cause us much tension would fade away."³

In the speech prepared by President Kennedy and intended for delivery in Dallas, Texas on November 22, 1963, were these prophetic words:

"Our adversaries have not abandoned their ambitions, our dangers have not diminished, our vigil cannot be relaxed."⁴

In the year 1967, the Soviet Communists are celebrating the 50th anniversary of the Bolshevik Revolution in Russia. During all of that time, Soviet leaders, both political and military, have continuously repeated declarations that Communism's ultimate objective is world domination.

Our own experience and current research fully confirms that the Communist objective is still that of world conquest. We affirm the current validity of the following statements by J. Edgar Hoover and Robert S. McNamara:

"Since the time of Lenin, atheistic communism has surged forth from Russia to enslave nearly one-fourth of the earth's surface and a third of her peoples. Nowhere are its advance battalions more active than in our own Western Hemisphere, where agents trained by the Kremlin continue to burrow deeply into countries of the Caribbean and Central and South America. Their deadly objective is to undermine legitimate governments, foment revolution and create a Soviet Union of Latin American Republics.

"I have said this before and I would like to repeat it here: We are at war with communism and the sooner every red-blooded American realizes this the safer we will be."⁵

2. State of the Union Message, January 11, 1962.

3. *The New York Times* (Interview with editor of *Izvestiya*) November 29, 1961, pp. 1, 18, 19.

4. *Public Papers of the Presidents, John F. Kennedy 1963*, U. S. Government Printing Office, p. 894.

5. J. Edgar Hoover, Address to Brotherhood of the Washington Hebrew Congregation, December 4, 1963.

"I do not believe that we can reasonably assume that these manifestations of a change in policy reflect a change in the ultimate objective of the Soviet leadership, which is to extend the sway of Communism over the rest of the world. Their dispute with the leadership of Communist China is not over the ultimate objective but how it is to be achieved and who is to control the world-wide Communist movement. Expansionism is so deeply engrained in Communist doctrine that it would be naive for us to expect any Communist leadership to repudiate it."⁶

In January 1967, General Earle G. Wheeler, Chairman of the Joint Chiefs of Staff, was asked in a series of questions if, in his opinion, the Soviets have abandoned their goal of world domination and were mellowing. He expressed his belief that they had not abandoned their goal of world domination. On the question of mellowing, he said:

"I don't believe they are mellowing at all. I believe they have adopted new tactics and are seeking new routes to the same objective."⁷

As Leonid I. Brezhnev, first Secretary of the Communist Party of the Soviet Union, said in his March 29, 1966 report to the 23rd Congress of the Communist Party of the Soviet Union:

"Ever harder times lie ahead for capitalism. The fact that it is doomed is becoming increasingly clear. But the capitalists will never surrender their rule voluntarily. The working class and the laboring masses will achieve victory only in the course of stubborn class battles. . . . At our Congress today we once more repeat the appeal: close ranks more solidly for the struggle against the common enemy!"⁸

Soviet Strategic Objectives

From our analysis, it is clear that the overall Soviet military objective is to achieve absolute strategic superiority.

The main thrust of the authoritative book, *Military Strategy*, edited by Marshal Sokolovsky, was toward achieving superiority. In a discussion of strategic missile forces, attainment of qualitative and quantitative superiority was set as one of the "most important problems in

6. Robert S. McNamara, Secretary of Defense, Statement before Joint Session of Senate Armed Services Committee and the Senate Subcommittee on Department of Defense Appropriations, January 1964, p. 4.

7. Hearings on S. 666 before Joint Session of the Senate Armed Services Committee and the Senate DOD Subcommittee on Appropriations, January 25, 26, 27, 30, 31, February 1 and 2, 1967, p. 407.

8. *Pravda*, March 30, 1966, pp. 2-9.

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establishing superiority over the enemy in modern weaponry was the material prerequisite for victory.⁹

Recently-deceased Soviet Defense Minister Marshal Malinovsky made a clear-cut statement concerning strategic superiority. In a pamphlet published in late 1962 by the Soviet Ministry of Defense he wrote: "The most characteristic feature of the present stage of development in Soviet military doctrine is the fact that it rests on the superiority of the Armed Forces of the U.S.S.R. over the armies of the most powerful countries of capitalism, both in military-technical resources, and from the morale and battle standpoint. This superiority and the just goals of our Armed Forces give us a firm confidence that in a future war . . . the victory will be won by us."¹⁰

Malinovsky's pronouncement takes on added significance in the light of a 1966 statement in the authoritative Soviet journal, *Communist of the Armed Forces*, that "military-technical superiority along with moral-political superiority is one of the most important factors in our time for the reliable defense of the country . . . (T)he significance of military factors themselves, in particular military-technical superiority over the enemy, has grown in contemporary circumstances as never before." The article goes on to stress that achieving military-technological superiority is a constant process and that "the stern dialectics of development are that the struggle for superiority must be waged continually . . ."¹¹

How do the Soviet leaders define superiority? *Communist of the Armed Forces* is quite clear: ". . . Military-technical superiority is such a correlation of quantity of military equipment and weapons, of the degree of troop training in using them and also of the effectiveness of the organizational structure of the army, that the given side has the advantage before a real or potential enemy and can defeat him . . ."¹²

This same 1966 article noted that Soviet superiority is derived from mobile Soviet intercontinental ballistic missiles and from Soviet advances in space technology. Soviet science, it continued, has created weapons new in principle "secretly nurtured in scientific research bureaus and construction collectives."

Additional evidence of the Soviet drive to attain strategic superiority is supplied by a January 1967 statement of the late Defense Minister

9. *Military Strategy*, V. D. Sokolovsky (ed.) Moscow, Voenizd-vo, 1963, (In Russian) p. 237.

10. *Vigilantly Stand Guard Over the Peace*, U.S.S.R., Ministry of Defense, 1962.

11. "Military-Technical Superiority is the Most Important Factor in a Reliable Defense of the Country," V. Bondarenko, *Kommunist Vooruzhennykh sil*, No. 17, September 1966 (In Russian).

12. *Ibid.* (Emphasis added.)

Mamnovsky. He hinted at Soviet expansion of Intercontinental Ballistic Missiles (ICBM) emplacements and at a burgeoning Anti-Ballistic Missile (ABM) program.¹³

What would they do with strategic superiority? Here's the basic doctrine:

"The essence of Soviet military doctrine is this: if a future war is unleashed by the imperialists, then it will be the decisive collision between the two opposing social orders, and nuclear rocket weapons will inevitably be used. All this pre-supposes an extremely violent and dynamic character of the conflict, high maneuverability of combat operations, the absence of continuous fronts and well-marked boundaries between front and rear, the appearance of possibilities for striking sudden blows of great force, both against the troops and the homelands of the warring nations. In connection with this, very great attention is devoted to the initial period of the war."¹⁴

In other words, if general war comes, the Soviets will try for a knock-out nuclear first strike in the initial period of the war.

Official Communist policy statements, however, emphasize their intention of winning world domination without a general nuclear war. This was expressively stated by Nikita Khrushchev in a speech in July 1963 as follows:

"Today the imperialists pretend to be brave--but only in words; in reality they tremble before the socialist world which is growing and gaining in strength. And let them tremble! So much the better for us!

"A fight is in progress between these two systems, a life and death combat. But we communists want to win this struggle with the least losses, and there is no doubt whatsoever that we shall win. This is why we are striving for victory, for the triumph of communism, without unleashing a world thermonuclear war."¹⁵

Official statements of Soviet policy since that time differ only in their choice of language.

However, we can draw little comfort from such statements because, as shown hereinafter, the principal Soviet military thrust has been to develop a massive and superior capability for nuclear war.

13. *Washington Post*, January 18, 1967.

14. "Increased Organizational and Directive Influences of the Party in the Armed Forces," L. P. Prusanov, *Problems of the History of the CPSU*, Moscow, February 1965.

15. *Soviet News*, July 22, 1963, pp. 51, 52 and 53.

The latest and most authoritative unclassified statements of United States objectives are to be found in the 1967 Senate testimony of Secretary of Defense Robert S. McNamara and his principal assistants.¹⁶

The testimony of all the principal witnesses relating to U. S. grand strategy in these Senate *Hearings* is the most definitive in the last six years. Much of it borders on the sensational, and the divergence of the views of the Joint Chiefs of Staff and of the Secretary of Defense is stated and explained far more frankly and specifically than in previous official testimony. The focus of much of the most significant testimony is on the strategic effects of the Soviet deployment of anti missile defense systems, whether and when the U. S. should deploy such a system, and the level of total U. S. strategic power required to maintain sufficient security on the U. S. side of the strategic balance.

The Secretary of Defense left no doubt that the military strategy of the United States is based on the concept of deterrence through a second strike in retaliation against a Soviet first strike. Thus he explained that:

"Our general nuclear war forces should have two basic capabilities:

1. To deter deliberate nuclear attack upon the United States and its allies by maintaining, continuously, a highly reliable ability to inflict an unacceptable degree of damage upon any single aggressor, or combination of aggressors, at any time during the course of a strategic nuclear exchange, even after absorbing a surprise first strike.
2. In the event such a war nevertheless occurred, to limit damage to our population and industrial capacity.

The first capability we call 'Assured Destruction' and the second 'Damage Limitation.' "¹⁷

In determining what this policy contemplates in relation to the strategic military balance, it is helpful to examine Mr. McNamara's testimony on the anti-ballistic missile. The principal reason given for

16. *Hearings before the Senate Committee on Armed Services and the Subcommittee on Department of Defense Appropriations, on S.666, Military Authorizations, Defense Appropriations, 1968, January 25-February 2, 1967.* Included in the printed *Hearings* at the front of the report is Secretary McNamara's prepared statement on Military Posture and the 1968-72 Defense Program, which was released to the public on January 23, 1967. Both the prepared statement and the actual testimony of the witness have been subject to deletions stated to be for purposes of national security.

17. *Ibid*, p. 44.

his conclusion that "we should not initiate an ABM deployment at this time" is that "the Soviet Union would be forced to react to a U. S. ABM deployment by increasing its offensive nuclear force still further . . ."

In explaining why he did not actually plan to deploy a damage limiting system, he said, "If the general nuclear policy of the Soviet Union also has as its objective the deterrence of a U. S. first strike (which I believe to be the case), then we must assume that any attempt on our part to reduce damage to ourselves (to what they would estimate we might consider an 'acceptable level') *would put pressure on them to strive for an offsetting improvement in their deterrent {offensive} forces.*" (Emphasis added.)

This is consistent with McNamara's February 1963 testimony that we were about to enter a new era in strategic balance between the United States and the Soviet Union, which he called an era of "mutual deterrence." At that time, McNamara said, "More armaments, whether offensive or defensive cannot solve the nuclear war dilemma. We're approaching an era when it will become increasingly improbable that either side could destroy a sufficiently large portion of the other's strategic nuclear force, either by surprise or otherwise, to preclude a devastating retaliatory load. This may result in future betterment . . ."18 1967 was the year mentioned by McNamara as the most likely beginning of the new era.

Under questioning by Senator Margaret Chase Smith of Maine, following the above testimony, McNamara denied that his anticipation of "mutual deterrence" could properly be equated with nuclear "parity" or "stalemate," and said he had repeatedly stated that it is his intention to "maintain nuclear superiority in terms of numbers of warheads versus the Communist bloc."

1967 testimony of Secretary of the Air Force Harold Brown, however, indicates that the United States policy may be to accept "parity":

"Militarily the Soviets have a very formidable missiles force. They are building missiles very fast. . . . You see, we have leveled out our missile forces. We announced how big our missile force was going to be. Our plans are that 5 years from now we will have just as many missiles as we have right now. They have known that. They have known that for a couple of years, and they keep on building.

"Now we can afford to let them build for a while, if they feel they want to 'catch up.' But there is evidence that if we stop, they don't necessarily stop. They haven't stopped. I think that

18. *The New York Times, Western Edition*, February 11, 1963, p. 12.

in our position, we can afford to let this go on for awhile, without over responding."¹⁹

In the final analysis, the best way to determine actual differences between the U. S. and the U.S.S.R. strategic military objectives is to compare their performances. For this purpose we will examine hereinafter such key areas as development of space weapons, production of nuclear materials, strategic military budgets, attitude toward research and development and the changing strategic military balance.

Development of Space Weapons

The United States policy on space weapons was first announced in 1961 by the then Deputy Secretary of Defense, Roswell L. Gilpatric:

"An arms race in space will not contribute to our security. I can think of no greater stimulus for Soviet thermonuclear arms effort in space than a U.S. commitment to such an effort. This we will not do."

This policy was confirmed in October 1963, when the United States announced its adherence to the United Nations General Assembly resolution banning the "Placing in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, installing such weapons on celestial bodies, or stationing such weapons in outer space in any other manner."²⁰

This resolution, however, contains no provision for inspection and no penalties for violation.

Although the Soviet Union has announced its compliance with the U. N. resolution, its official publication, *Izvestiya*, noted that while the U. N. had banned the *orbiting* of rockets that constitute weapons of mass extermination, it by no means banned "the manufacture of such missiles."

On July 4, 1965, Communist Party Chief Leonid Brezhnev declared that the Soviet's possess "orbital rockets."²¹

Brezhnev's claim was supported by the display of a three-stage missile in the Bolshevik Revolution Day parade on November 7, 1965. On November 8, 1965, both TASS and *Izvestiya* described it as an orbital missile. This weapon has since been code named SCRAP.

Subsequently, the Department of State announced that it had asked Moscow whether, in the light of the Soviet display of an orbital

19. Senate Hearings, January 25, 26, 27, 30, 31 and February 1 and 2, 1967, p. 876.

20. Report of the Committee on Foreign Relations, United States Senate on Executive M, 88th Congress, 1st Session (Exec. Report No. 3) Government Printing Office, 1963.

21. *Izvestiya*, July 4, 1965, p. 2.

rocket in the Revolution Day parade, the Kremlin still planned to abide by its pledges not to put such weapons into orbit.²² The Soviet answer was that the agreement did not bar *development* of such weapons.

While waiting for an official answer from the Kremlin, the Department saw fit to keep our country on record (as reported by UPI):

"The State Department reiterated the U. S. position that although either the United States or Russia could put such a weapon into orbit, there would be no military sense in doing so."

The Soviet attitude should have been no surprise to anyone. After an examination of the long history of broken Soviet treaties and agreements, a Senate Internal Security Subcommittee report concluded that:

"It keeps no international agreements at all unless doing so is clearly advantageous to the Soviet Union."²³

On March 12, 1964, at hearings before the House Appropriations Subcommittee, Dr. Harold Brown, then Director of Defense Research and Engineering, now Secretary of the Air Force, was asked how much money was being spent on studies of orbital bombardment vehicles. This is his official answer:

"My recollection is that we have no more than *three or four people* working in one of the contract organizations studying this question. We are *not doing any hardware work*. So that I would be surprised if more than a couple of hundred thousand dollars in fiscal 1964 is being spent on this, and certainly no more than that is planned for 1965.

"There are two reasons: First, it is not a very good idea. . . . Second, there is now a U. N. resolution which we subscribe to and the Soviets have subscribed to, not to put bombs in orbit. This does not prevent people from doing the development on it, but apparently *neither the Russians nor we believe it is a very important strategic weapon*. . . ." (Emphasis added.)

Late in 1966, President Johnson announced that the United States, the Soviet Union and more than 100 nations on the United Nations Political Committee had agreed upon the language of a formal treaty outlawing nuclear weapons in space. It has now been passed by the U. S. Senate. Again, no provision for inspection was included in the treaty.

The only known effective ways to assure the world that none of the nuclear-rocket powers are orbiting nuclear weapons are to inspect space rockets before launch, or to rendezvous with the orbiting rockets and

22. United Press International dispatch dated Washington, November 19, 1965.

23. *Soviet Political Agreements and Results*, Internal Security Subcommittee, Senate Committee on the Judiciary, Third Revision, Volume I, U. S. Government Printing Office, 1964, Foreword, p. VIII.

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open them to inspection in space ("go up there with a screwdriver,
as one AEC authority put it).

General Earle G. Wheeler's statement on the Treaty on Outer Space includes the following comment on verification:

"The Joint Chiefs of Staff remain concerned about the assured verification capability with regard to 'weapons in orbit.' The deployment of prohibited orbital vehicles could have serious implications, especially if it enabled an enemy to achieve effective surprise attack against our command and control facilities and military forces. Weapons in orbit could become a matter of grave consequence, particularly when utilized in conjunction with other strategic systems. The focus of the Joint Chiefs of Staff concern is upon the capability which the United States would have to define and respond to such a threat. . . .

"This threat can be answered only through intensified U. S. efforts to develop capabilities to detect and verify the orbiting of nuclear weapons or those threatening mass destruction. We must develop the capability of dealing with that threat should it materialize, with or without a treaty."²⁴

Production of Nuclear Materials

Another area to examine the implementation of the respective policies may be found in the requirements and the production of weapons-grade nuclear materials.

President Johnson announced in January 1964, the partial shut-down of American plants producing weapons-grade nuclear materials. On January 24, 1967, it was reported that the fifth such plant was deactivated.²⁵ The Soviet Union has made no comparable moves in this direction. The Atomic Energy Commission reported in November 1965, that there is "no evidence" that the Soviet Union had carried out nuclear materials cutbacks announced on April 26, 1964. Actually, according to Hanson W. Baldwin, military editor of *The New York Times*, the Soviet Union had doubled its production of weapons-grade nuclear materials during 1965.²⁶

Without access to classified material it is difficult to deal in quantitative terms with the comparative positions of the Soviet Union and the United States in the matter of nuclear stockpiles and production capacities. A generalized way of indicating Soviet interests in maximum

24. Hearings before the Committee on Foreign Relations, United States Senate on the Treaty on Outer Space, March 7, 13 and April 12, 1967, p. 84.

25. *The New York Times*, January 25, 1967, p. 9 (See Annex "Chronology of Weapons-Grade Nuclear Material Cutbacks.")

26. *The New York Times*, July 14, 1966, p. 14.

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production of nuclear fuel is to examine the expansion of Soviet gross requirements of fuel by function, and compare this in some crude way with United States requirements.

By 1960, the Soviet Union had expanded its list of uses for nuclear materials to include bombs, civilian uses, surface ships, submarines and missiles. Up to then, the gross requirements of both countries, by function, grew in parallel, with the United States slightly ahead because of its presumed lead in overall nuclear development.

Beginning in 1961, the United States' testing program was notably less active than the Soviet Union's. The Soviet Union broke the undeclared moratorium in September 1961, with a massive series which was impressive in many ways, one of them in the amount of weapons-grade nuclear material expended.

It was in this test series which extended from September 1961 into early 1962 that the Soviet Union was rumored to display an unusual interest in the anti-ballistic missile. That interest was sustained over the years and Secretary of Defense McNamara announced in December 1966, that the Soviet Union was deploying an operational ABM system.

Hanson W. Baldwin has reported that the Soviet nuclear tests were conducted in 1961 in such a way as to destroy two incoming missiles.²⁷ *U. S. News and World Report* reported a Soviet breakthrough in anti-ballistic missile defense that "produces the so-called 'X-ray effect' in intense proportions."²⁸ This effect is said to neutralize ICBM guidance equipment and fissionable material at great distance from the actual ABM explosion. Soviet ABM tests in 1961 and 1962 provided the knowledge which has permitted the U.S.S.R. to rush ahead with its ABM development and outstrip the United States. The atmospheric nuclear test ban has denied the United States the opportunity of ever catching up.

Anti-ballistic missiles, in order to be effective against many attacking ICBMs, must be widely deployed. The U.S.S.R.'s TALLINN system covers a vast area.²⁹ Although remarkable advances in anti-ballistic missile accuracy are claimed, it must still be assumed that, as in the air defense weapon systems, many defending weapons must be launched against each incoming warhead in order to achieve a high probability of destruction. In this respect, it would seem that the ABM's task will be similar to that of conventional anti-aircraft, setting up a radioactive

27. *The New York Times*, February 5, 1967, p. 1.

28. *U. S. News and World Report*, February 6, 1967, p. 36.

29. *The New York Times*, February 5, 1967, p. 1.

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Approved For Release through which the TCBM must pass. Either way, an ABM system will require a prodigious amount of fissionable material.

It can be assumed, therefore, that the Soviet Union has foreseen, at least since 1961, this tremendous requirement for weapons-grade nuclear material to counter American ICBMs. In this connection it would also appear that the United States had rejected the idea of producing an extensive ABM system as long ago as January 1964, when President Johnson announced cut-backs in manufacture of fissionable materials. (See Annex.)

Strategic Military Budgets

The increases of the U.S.S.R.'s military budget for 1967 to 14.5-billion rubles, up 1.1-billion rubles or 8.2 percent over the 1966 figure, is another reflection of the Soviet drive for military superiority when it is analyzed. In 1964 and 1965, when the Soviet Union announced budget cuts, actual spending continued to rise. Much other defense spending is filed under such headings as "science" and "financing the national economy." From such evidence it is estimated that Soviet military spending in 1967 may approach 20-billion rubles, or 30 percent above the announced figure.

Also,

"... While the Russians have a much larger standing army, the United States spends a lot more to pay, clothe and equip each of its soldiers. And Soviet tanks, a basic item of ground equipment, are hard to price accurately since they are made with heavily-subsidized coal and steel.

"Because of this 'warped' pricing structure, it would be useless to multiply the Soviet defense budget by the \$1.10 official exchange rate and use the resultant dollar figure to compare with America's defense effort, it is said.

"Officials estimate that if the Russians had to enter the American market place to buy the military goods and services that go into their defense establishment, they would have to pay from \$50-billion to \$60-billion a year."³⁰

According to *U. S. News and World Report*, "Russia . . . is found to be investing almost 70 percent of the budget in strategic offensive and defensive systems."³¹

Other experts on the Soviet budget estimate that "substantial" portions of the Soviet defense effort will be devoted to three principal

30. *The New York Times*, William Beecher, December 25, 1966, p. 27.

31. *U. S. News and World Report*, February 6, 1967, p. 34.

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areas: conventional forces, strategic attack forces, and air and missile defense forces, on a coequal basis.³²

Using Mr. Beecher's estimates, the Soviet strategic military budget is the equivalent of \$33½-billion to \$40-billion a year. Even at the official exchange rate, the Soviet strategic budget would be \$14.7-billion.

In his January 23, 1967 Posture Statement, Secretary McNamara reported that the total United States 1967 military budget would be \$68-billion. The budget for strategic forces was \$7.1-billion or 14 percent of the total military budget.

The above budget figures show a clear difference between the U. S. and Soviet strategic military intentions.

Soviet Research and Development Objectives

"First of all, we are facing today a formidable Soviet aerospace threat and a concerted Communist effort to achieve critical scientific breakthroughs, both of which factors pose a serious challenge to the continued strategic superiority of the U. S. Armed Forces."

General John P. McConnell³³
Chief of Staff Air Force

It should be more widely understood that science and technology provide the vital impulse in the Soviet society. The Soviet leadership views each new level of technology, each new medium for political or military operations, as offering opportunities for furthering its objectives. Unanticipated technological breakthroughs may be realized for leapfrogging America's means of deterrence. Thus, the Soviets are aggressively moving forward on the frontiers of strategic weapon technology.

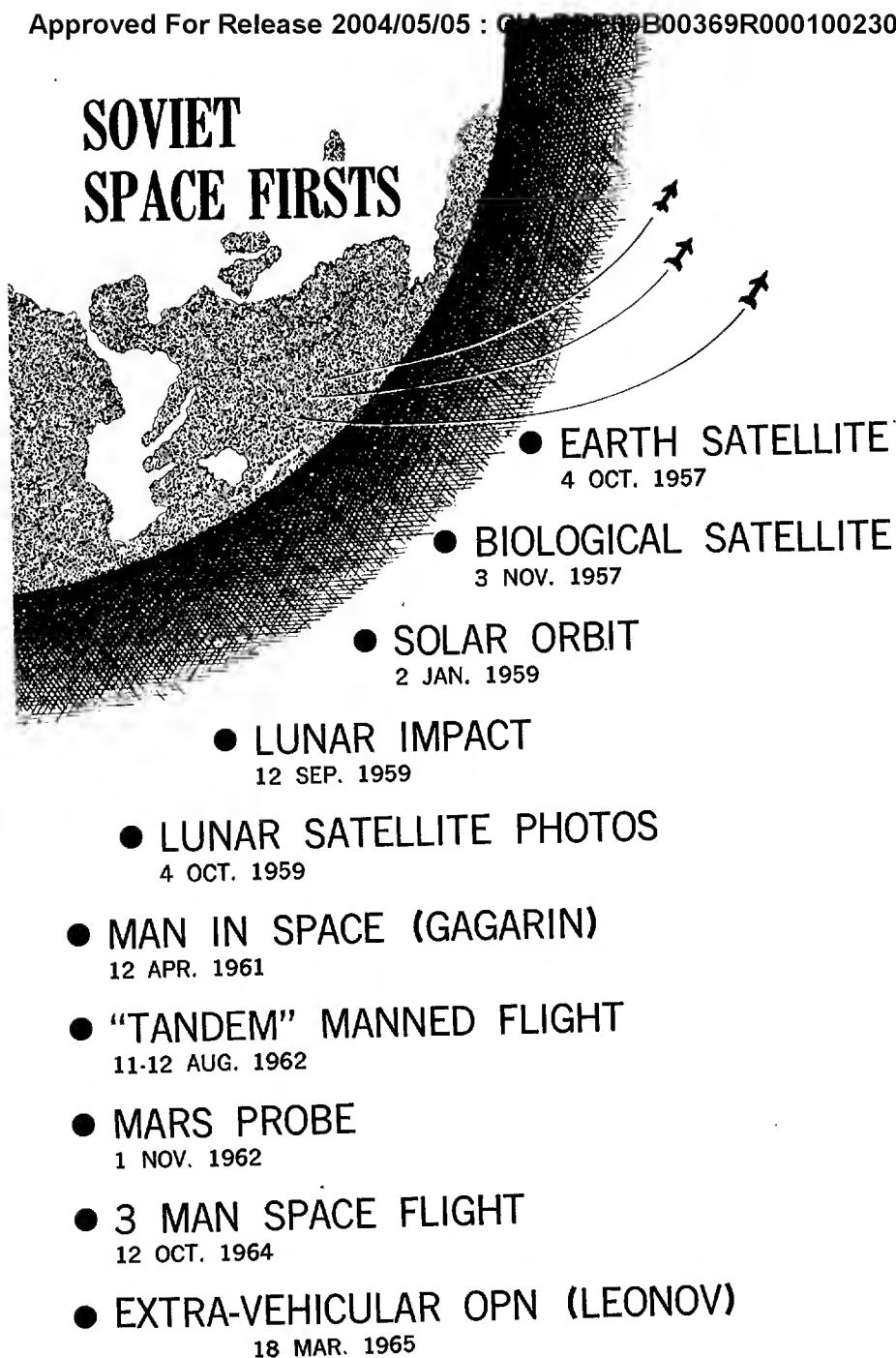
Space is one of the first arenas of major public interest in which Soviet industry, technology, and science gained—in fact, not in words—a leading international position. This is so despite the not inconsiderable United States achievements in space. In the public mind, apparent technological advantage in space has been readily translated into an image of military advantage.

One of the primary strengths of Soviet research and development and production programs is the use of scientific planning with cybernetics. This new technique is noted throughout U.S.S.R. weapons programs. Scientific planning, theory of games, optimum solution of com-

32. Beecher, op. cit.

33. Hearings on S. 666 before Joint Session of the Senate Armed Service Committee and the Senate DOD Subcommittee on Appropriations, January 24, 26, 27, 30, 31, February 1 and 2, 1967, p. 874.

SOVIET SPACE FIRSTS



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plex programs, automatic control, and hundreds of similar subjects, all pertinent to the modern techniques of scientific planning and development of aerospace weapon systems, are featured in Soviet cybernetic literature.³⁴

An analysis of overall Soviet power must now take into account the integrated cybernetic systems optimized for Soviet military and national security purposes.

United States Research and Development Objectives

U. S. Defense Department policy toward advanced research has been perceptively and most cogently stated and explained by a scientist who is in a commanding position to know the actual facts. Dr. Harold Agnew, Director of the Weapons Division of the Atomic Energy Commission's Los Alamos Scientific Laboratory, spoke at a recent Air Force Association symposium in San Francisco, on "The Technological Threat."

According to *Technology Week*:³⁵

"AEC's Dr. Harold Agnew declared that there appears to be a new concept of the balance of power.

* * *

"Agnew, whose comments drew the largest ovation at the symposium, said the present philosophy seems to be based on a concept that assumes that balance or equality is the optimum state for one nation to have vis-a-vis another state in order to have stability. . . . 'from my experience stability is gained and maintained only through superiority. Yet more and more today, we see decisions being made which have as their long range objective equality between the U. S. and other powers rather than superiority of the U. S. over other powers.'

* * *

"The apparent drift in national policy on the concept of balance of power and stability is resulting in a stifling of innovation. We find ourselves being authorized to build or to consider only those systems which respond to a clearly defined threat. As a result, we are continuously reacting on the defensive . . . since we react only to those systems or threats which have been proven to exist, and it takes several years to react, we are continually in danger of coming up with answers to threats which have changed, if indeed we come up with answers in a time frame which is relevant at all.'

34. Text of the Resolution Passed at the Third All-Union Conference on Automatic Control, translated by L. A. Zadeh. (Odessa: 1965), p. 1.

35. "AEC Weapons Expert Blasts DOD Technology," *Technology Week*, March 27, 1967, pp. 15, 16.

We are completely vulnerable to surprises, to new systems which we have not heard about, but which all of a sudden appear.'

* * *

"Agnew said it is clear that the Soviet Union recognizes the increased importance of technological breakthroughs. He quoted a recent Soviet Defense ministry document which said that Russia 'is not limiting itself to those military means which the adversary already has.' He said this contrasted with the position of some U. S. committees, such as the one on arms control headed by Jerome Wiesner and Roswell Gilpatric, that the U. S. should not innovate new weapons because this would be destabilizing.

"A specific example of this, he said, is the recommendation that we avoid an effective anti-missile system because it would upset what Wiesner and Gilpatric called the 'delicate balance of terror.'

* * *

"One of the greatest faults of U. S. policy makers, Agnew declared, 'is that they seem not to understand that technology will never be stagnant. It will not stand still.'"

This thesis of the U. S. policy-planned stagnation of innovation in U. S. advanced research was also comprehensively stated and extensively documented by Hanson W. Baldwin, in a "landmark" article,³⁶ under a title which states his theme: "Slow-down in the Pentagon." He reports that research, development, and innovation have sunk into stagnation in the Pentagon because of three major policies or attitudes: (1) "the technological revolution is over"; (2) disarmament or arms limitation "is the only way to political salvation and that therefore continued technological military development worsens the situation"; and (3) "the requirements merry-go-round"—mandate from the Secretary of Defense that every new project has to be justified on the basis of demonstrated military requirements, that is, that there must exist in advance a clear-cut military mission for a new weapons development.

Mr. Baldwin further points out that:

"Many promising developments—particularly in space—could never be pushed, or even demonstrated, if developments had to wait for the establishment of requirements.

"Invention has never followed this path; the machine gun and the tank would still remain blueprint dreams if their development had awaited the specification of clear-cut military requirements. One cannot state a requirement for an inventor's hopes.

36. *Foreign Affairs*, January 1965, p. 262.

“As Dr. Edward C. Welsh (acting Chairman of the National Aeronautics Space Council) pointed out, ‘If we had required a clear-cut prior mission, we would probably have developed no airplanes, no spacecraft, or, in fact, no wheel.’”

Both Dr. Agnew and Mr. Baldwin have done an outstanding job of explaining why the strategic military balance is changing.

The Changing Strategic Military Balance

To analyze the present strategic military balance, the following sections of this study compare the numbers of delivery vehicles and the total megatonnage delivery capabilities of the various strategic weapon systems. In addition, the figure on page 29 and the table on page 30 also show the general trend in total megatonnage delivery capability from 1962 to 1971 as delineated by the range of estimates derived from unclassified sources. These performance figures are the key to determining the real strategic military intentions of the U. S. and the U.S.S.R.

The general trend was established by plotting all available responsible unclassified estimates on a graph.

The preponderance of evidence points to the conclusion that the Soviet Union is succeeding in its massive drive toward strategic military superiority and that the United States is cooperating in this effort by slowing down its side of the arms race.

In 1962, the United States had a total megatonnage delivery capability ranging between 25,000 megatons and 50,000 megatons. The corresponding figures for the Soviet Union ranged between 6,000 megatons and 12,000 megatons.

The year 1967 falls in a crossover period with the U.S.S.R. estimates ranging between 16,000 and 37,000 megatons, to equal or exceed the U. S. estimated range of between 8,000 and 29,000 megatons.

It should be noted that the “nuclear capable” U. S. aircraft carriers are not included in the strategic balance either here or by Secretary McNamara.

For 1971, it appears that a massive megatonnage gap will have developed. U. S. delivery capability is estimated to range between 6,000 megatons and 15,000 megatons, whereas the estimated high for the Soviet delivery capability is 50,000 megatons, and the projection of the established Soviet range-curve indicates a low figure for the Soviets of approximately 30,000 megatons.

On the basis of this projection, the U. S. and the U.S.S.R. will have reversed their roles in a ten-year period.

Using the above approach, U. S. and Soviet strategic forces are approximately equal in strength at the present time. However, measurement of the strategic balance requires consideration of many additional factors including the following:

1. The above figures are based on peacetime inventory. Since the U. S. is committed to a second strike-policy, we should count only those U. S. strategic weapons which would remain after a Soviet first strike. There is no solid basis for estimating the remaining U. S. strategic weapons because the U. S. has not tested very high-yield warheads and therefore does not know the weapons effect of Soviet super-yield weapons of 50 megatons and over.
2. Some of the remaining U. S. missiles would be destroyed by the Soviet anti-ballistic missile defense. This important factor was not included in the above figures because of the lack of adequate unclassified data on the numbers and yield of Soviet ABMs.
3. Also, "a lesser amount of nuclear explosive does much greater damage to the United States than to the Soviet Union because of America's geography, urbanization and weather patterns."³⁷ The Soviet Union has three times as many square miles as the United States and its industries and cities are better dispersed.
4. Unclassified sources for the Soviet missile count appear to be based on the number of operational missile sites without consideration of refire capability. Thus, the actual Soviet missile count may be substantially larger than the unclassified estimates.
5. Many of the unclassified estimates as to Soviet strategic weapons yield are low because the sources have not given the Soviets credit for their great improvement in warhead yield/weight ratio in their 1961 nuclear tests. (See ICBM section for detail.)

Behind-the-iron-curtain unclassified sources report that the strategic military balance has changed in their favor. For example, in a compre-

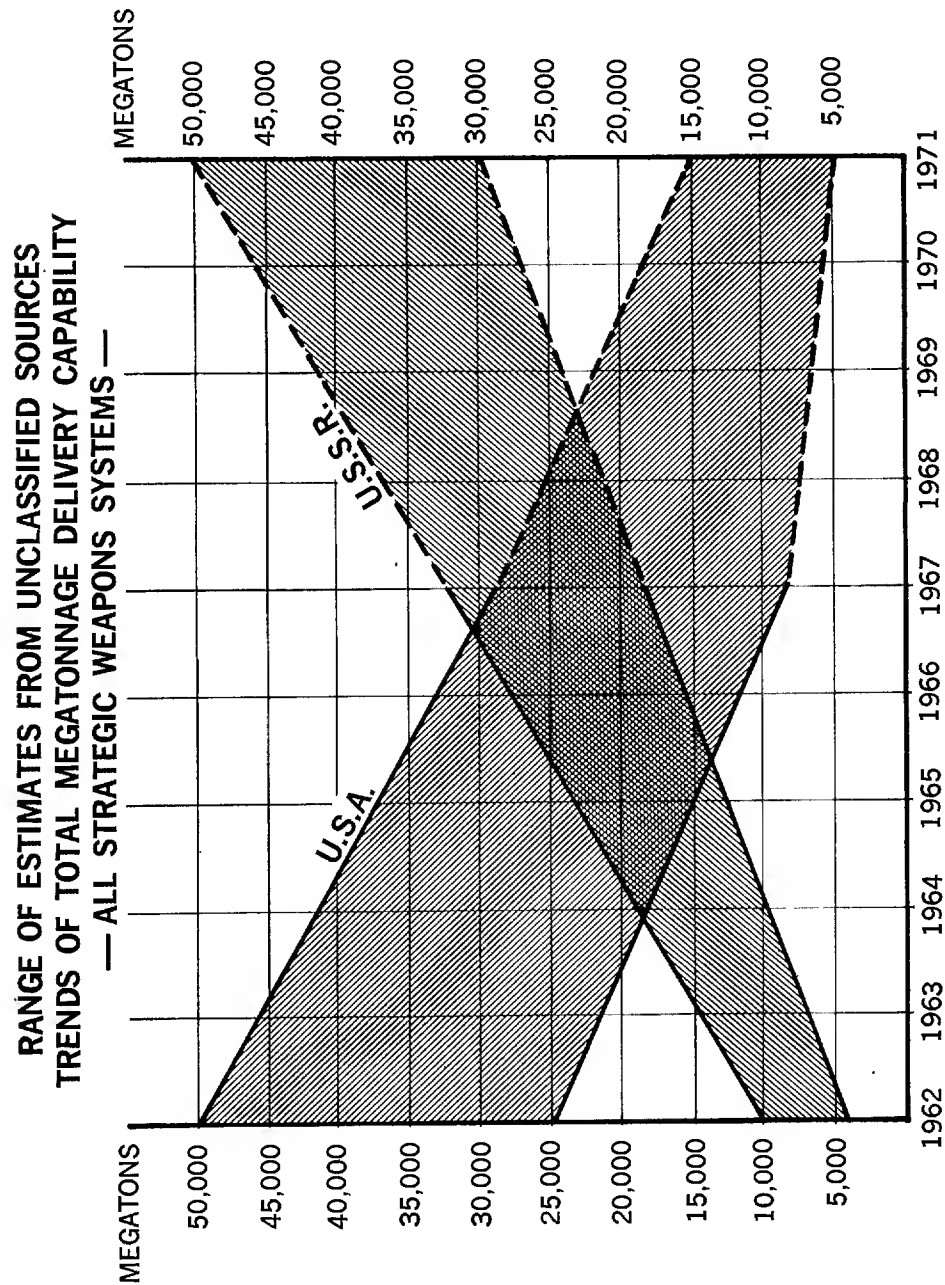
37. Arthur T. Hadley, *The Nation's Safety and Arms Control* (New York: The Viking Press, 1961), p. 34. Hadley's study is based upon the findings of a Summer Study Seminar held in Dedham, Mass., in 1960 under the auspices of the American Academy of Arts and Sciences and the Twentieth Century Fund. The participants included physicists, psychologists, lawyers, economists, mathematicians, political scientists and weapons specialists. Among those who took part were Donald T. Brennan, Hans A. Bethe, Morton H. Halperin, Herman Kahn, Thomas C. Schelling, Louis B. Sohn, Leo Szilard, Victor F. Weisskopf and Jerome B. Wiesner.

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hensive article analyzing the strategic military equation which he based
on unclassified sources, Lt. General Khristo Dobrev concludes:

"The deciding power in the world today is the socialist states. They have at their disposal everything necessary for taming the imperialist aggressors. The bare fact that it is not Moscow but Washington which is putting forward the question of reaching an agreement on 'freezing' the anti-missile defense system speaks sufficiently clear on which side lies the military superiority."³⁸

The United States does not appear to have a superior position in *deliverable* strategic weapons. There is still time to regain superiority but time is on the side of the one which uses it. Because of long lead times for weapon development and production, however, the decision to do so must be made in the year 1967.

38. Lt. General Khristo Dobrev, "On Military-Political Subjects: Anti-missile-Defense, A New Nightmare for U. S. Imperialists," *Rabotnichesko Delo*, (Sofia, Bulgaria: April 10, 1967).



**HIGHS AND LOWS OF ESTIMATES FROM UNCLASSIFIED SOURCES
NUMBERS OF DELIVERY VEHICLES—TOTAL MEGATONNAGE DELIVERY CAPABILITY
— ALL STRATEGIC SYSTEMS —**

1962	U. S.				U. S. S. R.			
	Estimated High	Numbers Low	Estimated Megatonnage High	Low	Estimated Numbers High	Low	Estimated Megatonnage High	Low
Bombers	2,500	1,570	49,000	24,470	1,500	750	10,050	5,000
ICBMs	234	90	450	450	100	50	1,000	750
IR-MRBMs	250	45	250	45	700	300	700	300
SLMs	144	96	101	67	50	0	50	0
TOTALS	3,128	1,801	49,801 MT	25,032 MT	2,350	1,100	11,800 MT	6,050 MT
1967								
Bombers	680	600	27,200	6,000	1,110	155	24,400	11,200
ICBMs	1,054	1,054	1,470	1,270	500	340	11,550	4,000
IR-MRBMs	0	0	0	0	750	700	875	700
SLMs	656	512	656	414	280	130	200	130
TOTALS	2,390	2,166	29,326 MT	7,684 MT	2,640	1,352	37,025 MT	16,030 MT
1971								
Bombers	465	435	12,300	4,350	One source predicts total megatonnage of 50,000. Several sources predict ICBM increases between 650 and 1,600 and official source predicts "very fast" increase. SLMs to increase at present rate. No sources predicted substantial increases for bombers or IR-MRBMs. U.S.S.R. curve constructed on basis of above fell within projections of curve from 1962 through 1967.			
ICBMs	1,054	1,000	2,000	1,000				
IR-MRBMs	0	0	0	0				
SLMs	656	544	656	544				
TOTALS	2,175	1,979	14,956 MT	5,894 MT				

Note: The "high" and "low" listed above are, respectively, the bases for the upper and lower edges of the U. S. and U.S.S.R. curves representing trends of total megatonnage delivery capability—all strategic weapons systems—depicted in the graph on the preceding page. Representative sources from which these estimates are derived are listed and excerpted, *infra*.

**SUMMARY OF SELECTED SOURCES DIRECTLY RELATING TO
BALANCE OF STRATEGIC WEAPONS IN
TIME PERIODS 1962, 1967, 1971**

The "Range of Estimates From Unclassified Sources, Trends of Total Megatonnage Delivery Capability—All Strategic Weapon Systems—" as depicted in the graph, *supra*, was based upon analysis and evaluation of hundreds of unclassified sources published during the entire time period of 1960 through April 1967. Sources studied included military and scientific books, treatises, journals and limited distribution studies. Also employed were trade and technical journals, news magazines, newspapers and publications of general and popular circulation.

To provide a ready reference for spot-checks and parameter confirmation, however, a summary is presented here of extracts from certain of those unclassified sources which relate directly to the initial, median, and terminal years covered by the graph which depicts the trend of the strategic balance in the decade from 1962-1971. The selection includes sources documenting the derivation of the "highs" and "lows" of deliverable megatonnage presented in the table which directly follows the Strategic Balance Graph, referred to above.

Thus the sources summarized support the upper and lower edges of the U. S. and U.S.S.R. curves representing trends of total megatonnage delivery capability. They include also, however, samplings from sources which fall within the areas delineated by the edges of the respective curves, providing thereby the basis for an appraisal as to the existence or absence of a consensus. The selection of sources for summarization emphasized publications more likely to be generally available to segments of the public not likely to have convenient access to scientific, technological, or strategic libraries.

1962—BOMBERS

U. S. News & World Report—August 13, 1962

U. S.	U.S.S.R.
700 Heavy Bombers \times 50 = 35,000 MT	150 Intercontinental Bombers \times 20 = 3,000 MT
1,000 Medium Bombers \times 5 = 5,000 MT	600 Medium Range Bombers \times 10 = 6,000 MT
TOTAL 40,000 MT	TOTAL 9,000 MT

U.S. News & World Report—February 6, 1967

U. S.	U.S.S.R.
1,700 Bombers — 49,000 MT (Estimate: 50,000 MT for all strategic systems; bomber megatonnage estimated at 49,000 megatons by subtracting from total an estimated 1,000 assigned to 200 ATLAS, TITAN and MINUTEMAN missiles and 100 POLARIS missiles.)	210 Long Range

Newsweek—November 19, 1962 (ISS cited)

U. S.	U.S.S.R.
Long Range Bombers 630	Long Range Bombers 200
Medium Range Bombers 1,000	Medium Range Bombers 1,300
1,630	1,500

Readers Digest—March, 1963

“While America Slept,” by James Daniel and John G. Hubble

U. S.	U.S.S.R.
30,000 MT (all strategic weapon systems) p. 267.	

The Military Balance— 1961-62, Institute for Strategic Studies

U. S.	U.S.S.R.
630 B-52's, 850 B-47's, 90 B-58's Total Strategic bombers 1,570	70 BEARS, 120 BISONS, 1,000 BADGERS Estimated megatonnage 1,190

The Nation's Safety and Arms Control
by Arthur T. Hadley, Viking Press, 1961

U. S.	U.S.S.R.
2,500 bombers 24,470 MT	

U. S. News & World Report—August 13, 1962

U. S.

U.S.S.R.

ICBMs $90 \times 5 \text{ MT} = 450 \text{ MT}$	$100 \times 10 \text{ MT} = 1,000 \text{ MT}$; or $75 \times 10 \text{ MT} = 750 \text{ MT}$
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U. S. News & World Report—February 6, 1967

U. S.

U.S.S.R.

200 ATLAS, TITAN and MINUTEMAN missiles	50 ICBMs
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Newsweek—November 19, 1962 (ISS cited)

U. S.

U.S.S.R.

234	75
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The Military Balance—1961-62, Institute for Strategic Studies

U. S.

U.S.S.R.

$ \begin{array}{rcl} 90 \text{ ATLAS} & 36 \text{ TITAN} & \\ & = 126 \text{ Total} & \\ \hline 3 \text{ MT} & 5 \text{ MT} & \\ 270 & + & 180 \\ \hline & = 450 \text{ MT} & \end{array} $	$75 \times 10 = 750 \text{ MT}$
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Readers Digest—March 1963

"While America Slept," by James Daniel and John G. Hubble

U. S.

U.S.S.R.

102 ATLAS 54 TITAN	75
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1962—IR-MRBMs

U. S. News & World Report—August 13, 1962

U. S.

U.S.S.R.

90 IRBMs	300 T-2 & T-4 (1 MT assumed) = 300 MT
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Newsweek—November 19, 1962 (ISS cited)

U. S. U.S.S.R.

250	700
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The Military Balance—1961-62, Institute for Strategic Studies

U. S. U.S.S.R.

30 JUPITERS—Italy 15 JUPITERS—Turkey <u>45</u>	$700 \times 1 \text{ MT} = 700 \text{ MT}$
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Readers Digest—March 1963

“While America Slept,” by James Daniel and John G. Hubble

U. S. U.S.S.R.

105 THOR and JUPITER	42 (in Cuba)
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1962—SLMs

U. S. News & World Report—August 13, 1962

U. S. U.S.S.R.

POLARIS $144 \times 1/2 \text{ MT}$ = 72 MT	$50 \times 1 \text{ MT (assumed)}$ = 50 MT
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U. S. News & World Report—February 6, 1967

U. S. U.S.S.R.

POLARIS 100	
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Newsweek—November 19, 1962 (ISS cited)

U. S. U.S.S.R.

POLARIS $96 \times .7 \text{ MT}$ (assumed) = 67.2	
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The Military Balance—1961-62, Institute for Strategic Studies

U. S. U.S.S.R.

POLARIS $144 \times .7 \text{ MT} = 100.8$	
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Readers Digest—March 1963

“While America Slept,” by James Daniel and John G. Hubble

U. S. U.S.S.R.

128 POLARIS	50 GOLEMS
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**Chronological Summary of Strategic Statistics Extracted From
THE MILITARY BALANCE—All Editions Covering Years 1961 through 1966—
As Published by THE INSTITUTE FOR STRATEGIC STUDIES, LONDON**

Numbers and Yield for ICBMs, IR/MRBMs and SLMs

U. S.			U.S.S.R.		
1961	54 ATLAS 9 TITANS	6 Nuclear subs—96 POLARIS TOTAL 264.2 MT	1961	50 ICBMs 200 IRBMs	TOTAL 700 MT
1962	90 ATLAS 36 TITANS 150 MINUTEMAN	9 Nuclear subs—144 POLARIS 45 JUPITERS TOTAL 754.8 MT	1962	75 ICBM's 700 IRBMs	TOTAL 1,450 MT
1963	126 ATLAS 108 TITANS 180 MINUTEMAN	10 Nuclear subs—160 POLARIS TOTAL 1,210 MT	1963	100 ICBMs 750 IRBMs	TOTAL 1,450 MT
1964	108 ATLAS 600 MINUTEMAN	26 Nuclear subs—416 POLARIS TOTAL 1,809.2 MT	1964	200 ICBMs 750 IRBMs	40 subs—120 missiles (400-mile range) TOTAL 3,750 MT
1965	ATLAS Phased out 54 TITANS 800 MINUTEMAN	31 Nuclear subs—496 POLARIS TOTAL 1,417.2 MT	1965	270 ICBMs 750 IRBMs	40 subs—120 missiles TOTAL 3,570 MT
1966	54 TITANS 850 MINUTEMAN	37 Nuclear subs—592 POLARIS TOTAL 1,534.4 MT	1966	300 ICBMs 750 IRBMs	40 subs—120 missiles TOTAL 3,870 MT
1967	54 TITANS 1,000 MINUTEMAN	41 Nuclear subs—656 POLARIS TOTAL 1,729.2 MT	1967	311 ICBMs 750 IRBMs	45 subs—135 missiles TOTAL 3,995 MT
Sources: 1961—The Mil. Bal. 1961-62, ISS, 1961, pp. 2, 3, 8, 9 1962—The Mil. Bal. 1962-63, ISS, 1962, pp. 3, 9, 10 1963—The Mil. Bal. 1963-64, ISS, 1963, pp. 3, 11 1964—The Mil. Bal. 1964-65, ISS, 1964, pp. 3, 5, 23 1965—The Mil. Bal. 1965-66, ISS, 1965, pp. 2, 3, 5, 23, 24 1966—The Mil. Bal. 1966-67, ISS, 1966, pp. 2, 3, 5, 25 1967—The Mil. Bal. 1966-67, plus ISS Strategic Survey published April 1967			Payloads: U. S. ATLAS—3 MT TITAN—5 MT MINUTEMAN—1 MT POLARIS—0.7 MT JUPITER—1 MT		
			U.S.S.R. ICBM—10 MT IR/MRBM—1 MT SARK-SERB fired from subs—1 MT ISS Summary—		

**NUMBERS AND BOMB LOADINGS FOR STRATEGIC BOMBERS
BOMB LOAD CAPACITY IN TONS OF CONVENTIONAL BOMBS**

U.S.				U.S.S.R.			
		B-52's	B-47's	B-58's	Totals		BEARS BISON'S BADGERS Totals
1961	No. Units	600	1,000	30	1,630	70	120 1,000 1,190
	Agg. Payload	22,500	10,000	180	32,680	1,400	1,200 10,000 12,600
1962	No. Units	630	850	90	1,570	70	120 1,000 1,190
	Agg. Payload	23,625	8,500	540	32,665	1,400	1,200 10,000 12,600
1963	No. Units	630	600	90	1,320	70	120 1,000 1,190
	Agg. Payload	23,625	6,000	540	30,165	1,400	1,200 10,000 12,600
1964	No. Units	630	380	90	1,100	70	120 1,000 1,190
	Agg. Payload	23,625	3,800	540	27,965	1,400	1,200 10,000 12,600
1965	No. Units	630	225	80	935	80	120 900 1,100
	Agg. Payload	23,625	2,250	480	26,395	1,600	1,200 9,000 11,800
1966	No. Units	600	Phased	80	680	100	110 900 1,110
	Agg. Payload	22,500	Out	480	22,980	2,000	1,100 9,000 12,100

Sources Used: 1961—*The Military Balance 1961-62*, ISS, 1961, pp. 3, 8
 1962—*The Military Balance 1962-63*, ISS, 1962, pp. 4, 9
 1963—*The Military Balance 1963-64*, ISS, 1963, pp. 4, 11
 1964—*The Military Balance 1964-65*, ISS, 1964, pp. 3, 22
 1965—*The Military Balance 1965-66*, ISS, 1965, pp. 3, 24
 1966—*The Military Balance 1966-67*, ISS, 1966, pp. 3, 25

Payloads in tons
 B-52 37.5
 B-47 10
 B-58 6
 BEAR 20
 BISON 10
 BADGER 10

ISS Summary—

1967-1 BOMBERS

Statement of Secretary of Defense—Senate Armed Services Committee
Hearings on S. 666—Military Authorizations—Defense Appropriations,
1968; January 25, p. 47

U. S.	U.S.S.R.
680 (no estimate of megatonnage)	155 (strategic medium-range Soviet bombers not counted in McNamara's statement despite refueling capability)

U. S. News & World Report—February 6, 1967

U. S.	U.S.S.R.
600	

The Military Balance—1966-67, Institute for Strategic Studies

U. S.	U.S.S.R.
600 B-52's 80 B-58's	100 BEARS 110 BISONS 900 BADGERS and BLINDERS

Space/Aeronautics—September 1966

"Strategic Missiles and Air Defense," by Leon H. Dulberger

U. S.	U.S.S.R.
	125 with round-trip ability 25 supersonic—non-round-trip

Washington Post—April 8, 1967

"Johnson Building Case for Reduction of Nuclear Margin"
by George C. Wilson

U. S.	U.S.S.R.
680 "U. S. Nuclear Bombers carry about 4 bombs each."	155

See 1962 listing and *Military Balance* summary *supra*,
for bomb loading examples.

Statement of Secretary of Defense—Senate Armed Services Committee
Hearings on S. 666—Military Authorizations—Defense Appropriations,
1968; January 25, p. 47

U. S.	U.S.S.R.
1,000 MINUTEMAN 54 TITAN II	340 (although listed under the date October 1, 1966, a foot- note states the figures are for "mid-1966" which would be June-July 1966)

U. S. News & World Report—February 6, 1967

U. S.	U.S.S.R.
1,054	500 (now 400—end of year 600)

The Military Balance—1966-67, Institute for Strategic Studies

U. S.	U.S.S.R.
54 TITAN II × 5 MT = 270 MT 1,000 MINUTEMAN 800 MINUTEMAN I × 1 MT = 800 MT 200 MINUTEMAN II × 2 MT = 400 MT Total 1,470 MT	300-500 (Assumed) 400 × 10 MT = 4,000 MT

New York Times—November 13, 1966
"Soviet Increases Build-Up of Missiles," by William Beecher

U. S.	U.S.S.R.
800 MINUTEMAN I 130 MINUTEMAN II with 70 more MINUTEMAN II for 1967 and 54 TITAN II	400-450 (as of October)

Associated Press—December 7, 1966
Dispatch dated Washington, by Bob Horton

U. S.	U.S.S.R.
U. S. maintains 3- or 4-to-1 advantage 1,600 ICBMs (Presumably including POLARIS)	450

Space/Aeronautics—September 1966

"Strategic Missiles and Air Defense," by Leon H. Dulberger

U. S.

U.S.S.R.

500

Washington Post—April 8, 1967

"Johnson Building Case for Reduction of Nuclear Margin"
by George C. Wilson

U. S.

U.S.S.R.

1,446 (including SLBM)

470 (including SLBM)

The New York Times—November 13, 1966

"Soviet Increases Build-Up of Missiles,"—by William Beecher

U. S.

U.S.S.R.

800 MINUTEMAN I
130 MINUTEMAN II
70 MINUTEMAN II in early
1967
54 TITAN II

400-450
A 3-stage liquid-fueled missile
"may carry a warhead ranging
from 30 to 60 MT"

"Soviet Missile Power"—a 'Credible Threat Now,' by Xenophon, *Triumph Magazine*, February 1967; Reprinted *U.S. News & World Report*, February 20, 1967 under title "The Danger is Very Grave"—Russia's Growing Arms Threat

U. S.

U.S.S.R.

"Few of the Soviet ICBMs have a lift capability of less than 7 megatons and most are 10 MT or more."
The Soviets "may be on the brink of deploying an ICBM capable of lifting the weight of their 100 megaton warhead."
"The U.S.S.R. with as few as 20 such missiles equipped with multiple warheads of 1 megaton each—could acquire the capability of striking 2,000 targets, more than the entire existing U. S. strategic missile arsenal can now cover."

Space/Aeronautics—September 1966
“Strategic Missiles and Air Defense,” by Leon H. Dulberger

U. S.	U.S.S.R.
	Of the several classes of land-based strategic missiles <i>in the Soviet inventory</i> , the most powerful, most sophisticated ICBM's are SAV-AGE . . . SCRAG . . . and the so-called PROTON booster, with a thrust of over 2-million pounds and easily able to loft a 100 MT warhead."

Technology Week—March 27, 1967
“Soviets Narrowing ICBM Gap,” p. 33

U. S.	U.S.S.R.
“Brown told the committee that the United States <i>‘does not have a 3-1 superiority in ICBM payload over the Soviet Union, because their missiles carry somewhat more than our own do. ‘But,’ he added, ‘I think that as of this moment we probably have more total missiles. I think that ratio won’t be true in another year or two.’</i> ”	<p>“Air Force Secretary Harold Brown has told the Senate Armed Services Committee that the Soviet Union is rapidly closing the missile gap and may equal the U. S. in numbers of ICBMs in a year or two.</p> <p>“Brown, questioned at length on the Soviet ICBM threat by the committee, said that the Soviets have a very formidable missile force and that they are building new missiles ‘very fast.’</p> <p>“In explaining what amounts to a Soviet attempt to close the missile gap, Brown said ‘we leveled out our missile forces. We announced how big our missile force was going to be. Our plans are that five years from now we will have just about as many missiles as we have right now. <i>They have known that. They have known it for a couple of years, and they just keep on building.</i>’</p> <p>“Now we can afford to let them build for a while, if they feel they want to ‘catch up.’ But there is evidence that if we stop, they won’t necessarily stop. They haven’t stopped.”</p> <p>“‘I think,’ Brown told the committee, ‘that in our position we can afford to let this go on for a while without over-responding.’”</p>

The Military Balance—1966-67, Institute for Strategic Studies

U. S.	U.S.S.R.
	700-750 SKEAN = 1-2 MT SANDAL = 1 MT Assume 1/3 SKEAN: 500 SANDAL \times 1 MT 250 SKEAN \times 1.5 MT 500 + 375 MT = 875 MT

Washington Post—April 8, 1967
"Johnson Building Case for Reduction of Nuclear Margin"
by George C. Wilson

U. S.	U.S.S.R.
	750

1967—SLMs

Statement of Secretary of Defense—Senate Armed Services Committee
Hearings on S. 666—Military Authorizations—Defense Appropriations,
1968; January 25, p. 47

U. S.	U.S.S.R.
512	130

U. S. News & World Report—February 6, 1967

U. S.	U.S.S.R.
656	130

The Military Balance—1966-67, Institute for Strategic Studies

U. S.	U.S.S.R.
592 POLARIS \times .7 MT = 414 MT	120 SLBM \times 1 MT = 120 MT 160 SLCM \times .5 MT = 80 MT (. 5 MT est.) 200 MT

The New York Times—July 14, 1966
“U. S. Lead in ICBMs is Said to be Reduced,” by Hanson Baldwin

U. S.	U.S.S.R.
592	250 (including 100 “winged” cruise missiles)

The New York Times—November 13, 1966
“Soviet Increases Build-Up of Missiles,” by William Beecher

U. S.	U.S.S.R.
608 POLARIS \times 1 MT = 608 MT “Slightly less than 1 MT”	120-150

Space/Aeronautics—September 1966
“Strategic Missiles and Air Defense,” by Leon H. Dulberger

U. S.	U.S.S.R.
	150 SLBMs 100 SLCMs

1971—BOMBERS

Department of Defense Testimony—Senate Committee on Armed Services, *Hearings* on S. 666, Military Appropriations, Defense Appropriations, 1968; January 25-February 2, 1967, p. 248.

U. S.	U.S.S.R.
Secretary of Defense McNamara testified before Senate Armed Services Committee that there would be 255 B-52G-Hs through fiscal year 1972 and 210 FB-111s	

Space/Aeronautics—September 1966
“Strategic Missiles and Air Defense,” by Leon H. Dulberger

U. S.	U.S.S.R.
	125 with round-trip capability 25 supersonic non-round-trip Soviet Mach 2.35 supersonic transport now in development could become supersonic intercontinental bomber.

Department of Defense Testimony—Senate Committee on Armed Services, *Hearings* on S. 666, Military Appropriations, Defense Appropriations, 1968; January 25-February 2, 1967—(all MINUTEMAN are replaced by IIs or IIIs) pp. 64, 240.

U. S.	U.S.S.R.
1,054	

U. S. News & World Report—February 6, 1967

U. S.	U.S.S.R.
1,054 MINUTEMAN and TITAN II 5,000 MT (all weapons)	1,000 + missiles 50,000 MT (all weapons)

The New York Times—July 14, 1966

"U. S. Lead in ICBMs Said to be Reduced," by Hanson Baldwin

U. S.	U.S.S.R.
1,054	600 in 1968

U. S. News & World Report—December 19, 1966

U. S.	U.S.S.R.
1,600 (including SLM)	Now 400, + 300 to 400 a year additional through 1970—est. 400 + 300 a year for 4 years = 1,600

Washington Post—April 8, 1967

"Johnson Building Case for Reduction of Nuclear Margin"
by George C. Wilson

U. S.	U.S.S.R.
1,000 MINUTEMAN \times 1 MT = 1,000 MT	650-1,000 Some missiles of 1 MT but "hundreds of missiles with warheads between 7 and 25 MT." "Some military leaders say privately that the U. S., not Russia, is faced with a 'megatonnage gap.'"

The New York Times—November 13, 1966
“Soviet Increases Build-Up of Missiles,” by William Beecher

U. S.	U.S.S.R.
	Rate of increase of numbers “roughly 100 or more a year over the last 2 years.” (est.) 450 + 100 a year for 4 years = 850.

1971—MR-IRBMs

U. S.	U.S.S.R.
None	All sources quoted for 1967 statistics tend to indicate same numbers maintained through the years—consensus is 700 to 750 in numbers and 700 to 875 MT in explosive power.

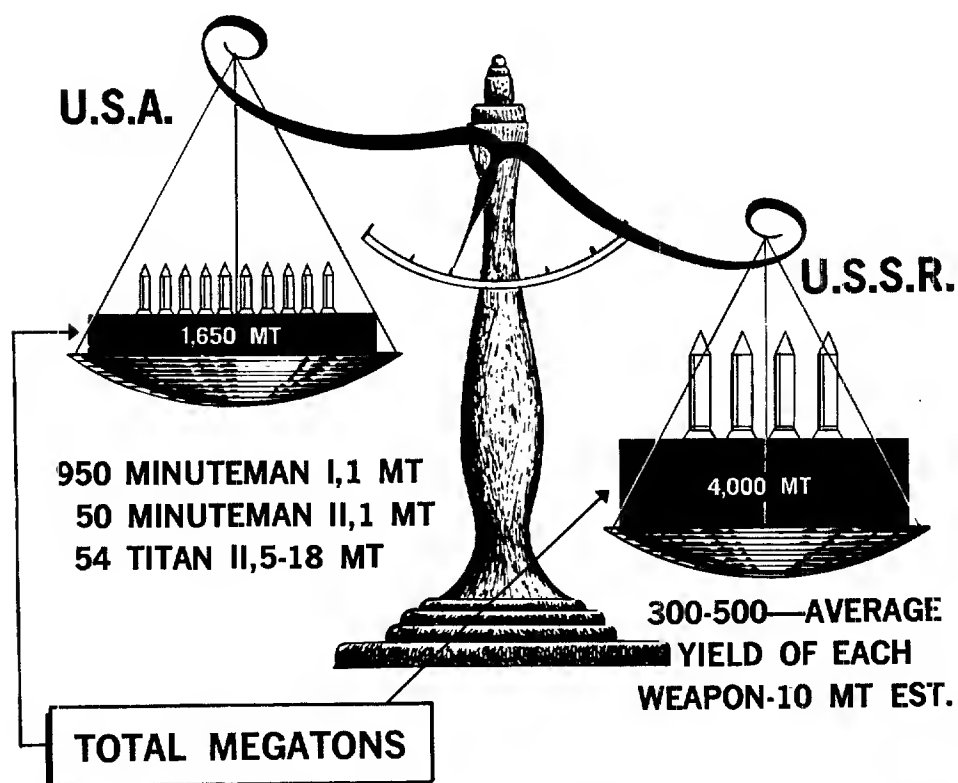
1971—SLMs

U. S.	U.S.S.R.
Secretary of Defense Testimony is that there will be no increase in the present number 41 of Fleet Ballistic Missile Submarines—but that in the 1970 period the present POLARIS submarines will be reconstructed to carry the POSEIDON missile at a cost of 60 percent of new submarine construction. <i>Senate Hearings</i> on S. 666 Military Authorizations—Defense Appropriations, 1968, January 25-February 6, 1967, p. 62. This “retrofit” program is to be spread over a period of years on a schedule tied to the regular overhaul cycle. Note: If 7 were converted at a time, and the process required 2 years for each group of 7, some 12 years would be required, and the deployable force would be proportionately reduced for that period.	<i>The Military Balance 1966-67</i> , Institute for Strategic Studies, does not project any figures for 1971, but says that present production of nuclear submarines is “at the rate of at least five a year.”

II. THE STRATEGIC MILITARY BALANCE

ICBM BALANCE

INTERCONTINENTAL BALLISTIC MISSILES



Note: Although the U.S. has more weapons, the U.S.S.R. has heavier war-heads. Effects of high-yield explosions on our ICBM systems are largely unknown because of the inability to make atmospheric tests. U.S. has reached a numbers plateau. USSR force continues to grow. Mr. McNamara has said he believes Soviets continue to increase ICBM deployment.

INTERCONTINENTAL BALLISTIC MISSILES

U. S.	U.S.S.R.
<p>950 MINUTEMAN I (1 MT) 50 MINUTEMAN II (1 MT) 54 TITAN II (5-18 MT)</p> <p>Deliverable warheads approximately 1,650 MT. With TITAN II warhead calculated at 5 MT instead of 12 MT, the deliverable warheads approximately 1,270 MT.</p> <p>Most recent official office of Secretary of Defense figures show total of 934 ICBMs in mid-1966.</p>	<p>300-500 ICBMs of various models, including:</p> <p>SCRAG, a three-stage, liquid propellant ICBM, 30 MT first displayed on May 9, 1965 in Moscow has a range of about 8,000 miles as ICBM. Also has orbital capability.</p> <p>SAVAGE, a three-stage solid propellant missile like our MINUTEMAN with a range of over 5,000 miles.</p> <p>SCROOGE, a solid propellant rocket on a SCAMER erector-launch vehicle.</p> <p>SASIN, a two-stage liquid propellant rocket.</p> <p>Most recent official office of Secretary of Defense figures show total of 340 ICBMs as of mid-1966.</p> <p>Soviet ICBMs deployed in quantity have a minimum of 10 MT warhead capability.</p> <p>Deliverable warheads approximately 4,000 MT.</p>

SAMPLE SOURCES

The Military Balance 1966-1967, ISS, 1966, pp. 25, 44.

"Strategic Missiles and Air Defense," Leon H. Dulberger, *Space/Aeronautics*, September 1966, p. 62.

Missile/Space Daily, December 6, 1966.

Military Review, November 1966, pp. 106-107.

Secretary of Defense, Senate Testimony, January 25-February 2, 1967, p. 47.

The 1,000th American MINUTEMAN intercontinental ballistic missile will be deployed in a site that has just been activated near Malmstrom Air Force Base, Montana. This site will contain 50 new MINUTEMAN II missiles, a considerable improvement over MINUTEMAN I, which comprise the remaining MINUTEMAN force. Warheads of MINUTEMAN I are reputed by unclassified sources to yield one megaton. MINUTEMAN II may have somewhat higher yield, or a trade-off with penetration aids.

The United States has also deployed 54 TITAN II missiles with a warhead yield of over 5 megatons.³⁹ There are no plans to increase this ICBM force. In fact, on February 12, 1967 the Department of Defense let it be known that the TITAN II would be phased-out beginning in 1970⁴⁰ and Secretary of Defense McNamara revealed in his 1967 Posture Statement that he had ended procurement of new TITAN boosters "with the FY (Fiscal Year) 1966 buy." In other words, the TITAN II phase-out has already begun.

The Soviet Union has between 300 and 500 ICBMs, all of which are reputed to have a warhead yield of at least ten megatons.⁴¹ This estimated yield is probably low for some Soviet missiles, such as the new SCRAP which mounts a 30-to-50 megaton warhead and can be used either as an ICBM or as an orbital space weapon.⁴² Some sources attribute 500 missiles to the Soviets.⁴³

In his Posture Statement of January 23, 1967, Secretary McNamara credited the United States with 934 ICBMs and the Soviet Union with 340 as of mid-1966.

The total yield of the United States ICBM force is estimated at 1,650 megatons, while Soviet missiles can yield at least 4,000 megatons.

However, these unclassified estimates are probably low for Soviet missiles. Few unclassified sources have revised their Soviet warhead

39. *The Military Balance* 1966-67, (London: Institute for Strategic Studies, 1966), p. 25.

40. *The New York Times*, February 13, 1967, p. 1.

41. *The Military Balance*, op. cit. p. 44.

42. *Ogonokh*, No. 20, May 1965.

43. *Business Week*, January 14, 1967, p. 88.

the 1961 Soviet nuclear tests. Typically, the Institute for Strategic Studies still shows Soviet missile warheads at the same yield as they did in 1961—10 megatons.

In their 1963 paper submitted to the Senate Committee on Foreign Relations during the debate on the Test Ban Treaty, the Joint Chiefs of Staff said that as a result of the 1961 tests:

“The U.S.S.R. is ahead of the United States in the high-yield—tens of megatons—technology . . . and in the yield/weight ratios of high-yield devices . . . if the Treaty goes into effect . . . the U. S. would not be able to overtake the present advantage . . .”⁴⁴

An authoritative appraisal of U. S./U.S.S.R. position as to high-yield weapons after the 1961 Soviet tests gains was made by Charles J. V. Murphy, a long-established expert in the area of nuclear weapons. His article was published in *Life*, February 16, 1962, and its accuracy has never been challenged. Although Mr. Murphy carefully refrains from stating exact yield/weight ratios, he does say that the Soviet gain was “several fold” and makes the following comparison:

“The (Soviet) 100 megaton warhead, according to some nuclear scientists, probably does not weigh more than 15 tons and may even weigh less than 10 tons. . . . By comparison, the warhead of our largest rocket, the TITAN, weighs nearly half as much as the lowest estimate for the Soviet warhead while its yield is probably less than 1/10 as high.”

Thus it would appear that since 1961, the Soviets have had a 5-to-1 advantage over the U. S. in yield/weight ratio in contrast to their pre-1961 inferiority.

It seems reasonable to assume that this improved capability has by now been used in upgrading missile warhead yield.

Some American planners believe that the numerically larger American force is superior on the premise that a one megaton warhead is powerful enough to destroy any city and accurate enough to take out a hardened Soviet launching site.

They also believe that most Soviet launching sites are “soft” and extremely vulnerable to a MINUTEMAN warhead. However, the softness or hardness of Soviet launching sites has little relevance unless America strikes first, something present U. S. policy would never permit.

44. *Nuclear Test Ban Treaty, Hearings*, Committee on Foreign Relations, 88th Congress, 1st Session, (Washington: Government Printing Office, 1963), p. 273.

There is questionable value in destroying a Soviet ICBM site which has already expended its first missiles unless the site has a reload capability. It is argued that for logical deterrence, which is the U. S. strategy, the city-busting potential of the MINUTEMAN force, backed with a few heavy TITAN II missiles, appears to be adequate at the present time.

Even if numbers were to be considered as more important than power, Secretary McNamara in his January 23, 1967 Posture Statement estimated that in a future nuclear war about half of our missiles would be knocked out if the Soviets strike first.

Even if our remaining ICBMs were to function perfectly, it is difficult to estimate how many might be destroyed by Soviet anti-ballistic missile defense. (See ABM section of this study.)

The high yield of Soviet ICBMs leads one to question the invulnerability of our own hardened ICBM sites. None of the American sites has been tested against such great explosive power as the Soviets demonstrated in their 1961-62 nuclear tests, although various smaller-scale tests have been conducted. The Department of Defense is confident that scaling up of the smaller underground explosions can lead to accurate prediction of the effects of massive multi-megaton explosions. However, some scientists question this concept. They assert that when an explosion is scaled up beyond a factor of ten, entirely new effects can be expected.

It is conceivable, therefore, that the electro-magnetic pulse or some unexpected effect of a high-yield Soviet warhead might knock out an entire MINUTEMAN complex regardless of the hardening and shielding attempted. Many scientists express concern that very high-yield explosions may cause a total communications blackout and thus prevent the transmission of a presidential order to retaliate. The Soviet Union has tested very high-yield warheads. The United States has not. Under the restrictions of the atmospheric Test Ban Treaty, the United States can only guess at what unique effects might occur when very high-yield weapons are exploded. But the Soviets *know*.

Considering the above, Soviet missiles might well be able to deal a first-strike knockout blow to our hardened ICBMs—if not today, some time in the future as the Kremlin leaders continue to upgrade their force in quality and numbers. Should the Soviet Union be convinced of this capability and should it have determined a way to nullify the United States POLARIS missiles (see SLM section of this study), the U.S.S.R. would be in a position to exercise nuclear blackmail. War

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might become unnecessary for Soviet victory. In such an eventuality, only an anti-ballistic missile defense or *surrender* could save American lives.

Some questions have even been raised concerning the credibility of a strategic deterrence based solely on "second-strike" retaliation. For example, Paul Nitze, presently Secretary of the Navy and Assistant Secretary of Defense until he was appointed to the Navy, presented a paper at the National Strategy Seminar at Asilomar, California in April 1960 in which he said:

"The principal problem . . . with this alternative, (an invulnerable second-strike, purely retaliatory capability) is that it provides us with no rational military strategy if deterrence fails . . . *If deterrence fails, the only reaction open to us is retaliation in support of a purpose that no longer exists—the purpose of deterring the enemy from taking the action they have already taken.*"⁴⁵

Suppose the Soviets use this as the basis for estimating the credibility of our stated intention of retaliating? Might they not reason somewhat as follows:

Secretary McNamara has testified that a Soviet first strike against the United States could result in 120 million U. S. fatalities.⁴⁶ After this has happened, Secretary McNamara says that the United States would strike back at the Soviets, and that enough of our strategic weapons would have survived the Soviet strike to enable us to strike back and kill 120 million people in the U.S.S.R.

The target of our retaliation would be *people*. Secretary McNamara revealed this expressly for the first time in his 1967 testimony before the Senate Committee on Armed Services, as follows:

"If we were to strike after they struck us, the question is, what would we launch our missiles against? I think all would agree that we would launch against their cities. They have already launched all their missiles against us."

With most of the American population dead, would it then be rational to launch a retaliatory strike with their surviving strategic forces? If the 70 million survivors prefer to remain as survivors, they might forego a retaliatory strike, so as not to invite a Soviet mop-up attack by their follow-on bombers and missiles from sites with refire capability. A retaliatory strike certainly would not help the 120 million Americans

45. *Proceedings, Asilomar National Strategy Seminar*, p. 6 (Emphasis added.)

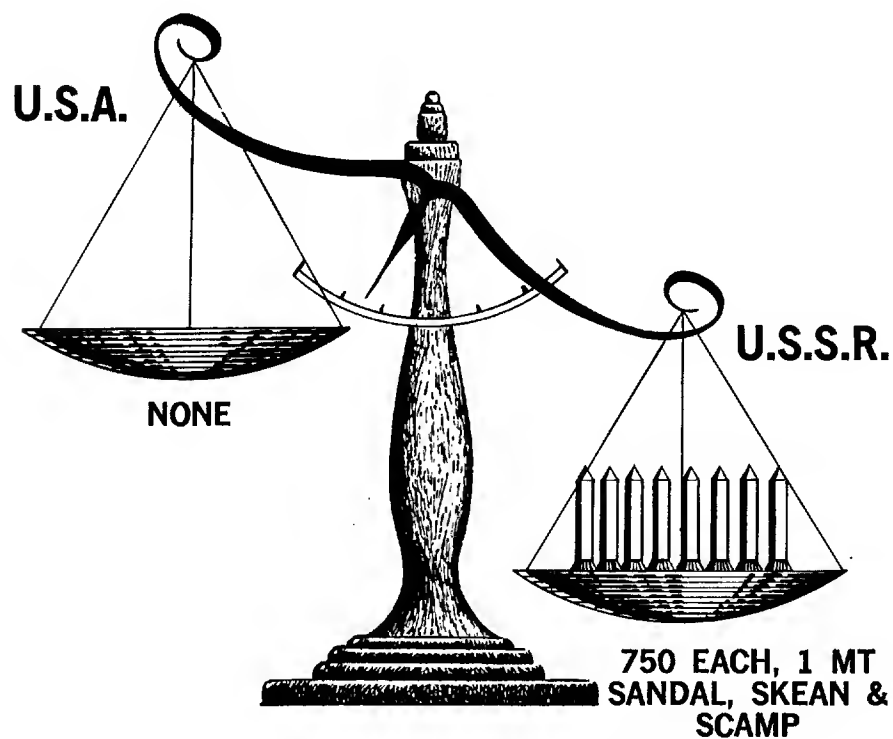
46. *Posture Statement*, January 23, 1967, p. 53.

already dead. Disregarding the fact that the Soviets, upon launching their first attack would have evacuated their cities, and assuming that Secretary McNamara's figures are correct, namely, that the American retaliatory strike could kill 120 million Russian people, why *should* the remaining Americans launch such a futile attack? The people whom they would kill had no say in their government's decision to strike.

We are confident that the remaining Americans would retaliate, but the key question is whether the *Soviets* believe this.

IRBM/MRBM BALANCE

INTERMEDIATE/MEDIUM RANGE BALLISTIC MISSILES



Note: Soviets have missiles deployed in western U.S.S.R., threatening NATO cities and military installations. This is a strategic deployment and must be considered in context with ICBM balance and SLBM balance. NATO has neither adequate warning nor retaliatory system. Also, many Soviet MRBM/ICBMs are mobile and will be difficult to target.

INTERMEDIATE RANGE—MEDIUM RANGE BALLISTIC MISSILES

U.S.A.	U.S.S.R.
NONE	<p>750 of various models dating from 1956 deployed principally in western U.S.S.R. Warhead average approximately 1 MT.</p> <p>Latest model SCAMP, first shown in Moscow in May 1965, appears to be completely mobile, including its firing platform.</p>

SAMPLE SOURCES:

The Military Balance 1966-1967, Institute for Strategic Studies, 1966, p. 3; *Military Review*, November 1966, p. 107.

II-B. INTERMEDIATE/MEDIUM RANGE MISSILES (IRBM/MRBM)

The Soviet Union has at least 750 intermediate and medium-range ballistic missiles (1500-to-2500-mile range), mainly in western Russia. These are code-named SANDAL, SKEAN and SCAMP. The latter was first shown in May 1965 and is a mobile version, which indicates that the Soviet Union continues to upgrade IRBM/MRBMs. The United States has no comparable missiles nor is it developing any.

NATO assumes that the 750 Russian missiles are targeted at the major military installations and population centers in Western Europe, including London, Paris, Frankfurt, the Ruhr, Hamburg, Munich, and the NATO headquarters and bases. Because they presented a major threat to NATO, the United States provided IRBMs, THORs and JUPITERs in England, Italy and Turkey. These missiles became operational just before the Cuban missile crisis in 1962. After the crisis, the United States dismantled its entire NATO IRBM operation.

Nothing is now left of the extremely expensive U. S. complex of THORs and JUPITERs which were capable of countering Soviet IRBMs. The reason given for removing them at the time was that the IRBMs were obsolete and were being replaced by POLARIS missiles. (See SLM section.) The fact is, however, that U.S. IRBMs in Europe had hardly been installed when they were removed. Many strategists do not accept the explanation that the missiles had become obsolete so quickly.

The principal counters to the Soviet IRBMs at this time are the POLARIS submarines operating in the Mediterranean and other waters within range of the Soviet Union, and NATO fighter-bombers capable of carrying nuclear weapons. Secretary of Defense McNamara has announced that we have 7,000 tactical nuclear weapons in Western Europe⁴⁷, many of them no doubt capable of being carried by fighter-bombers but most of them tactical weapons which would be used only in the event the Soviets attacked with ground forces.

Since the western powers have no intention of launching a first strike, fighter-bombers can be considered reaction weapons. How many

47. *Posture Statement*, January 23, 1967, p. 68.

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Airfields would be left operational after a Soviet first strike with nuclear missiles? Airfields certainly would be a prime target for the 750 Soviet IRBM/MRBMs.

The American nuclear-capable PERSHING, a tactical missile with a range of perhaps 400 miles, is available in Europe but could not be considered as a counter to the Soviet IRBM/MRBMs because of its short range. PERSHING cannot reach into the Soviet Union from European bases, no matter how close it is placed to the Iron Curtain.

Europe's confidence in the United States' pledge to defend it against Soviet nuclear attack has understandably been shaken by our failure to maintain a counter-force to the Soviet IRBMs. After the U. S. removed its THOR and JUPITER missiles, there followed the long, abortive give-and-take debate about providing NATO with sea-based intermediate range ballistic missiles. But many NATO powers believe that the United States is no longer certain it would use its POLARIS missile and ICBMs if the Soviet Union launched its IRBM/MRBMs against Europe.

The pull-out of THORs and JUPITERs, the failure of discussions on the multilateral nuclear force to bear fruit, the quibbling by American officials in NATO discussions of strategic nuclear retaliation have combined to raise doubts, (first in France, and more recently, in Germany) about the reliability of the American deterrent against Soviet attack in Europe.⁴⁸

Soviet military writers and Soviet publications have indicated repeatedly that Moscow policymakers consider Western Europe to be the Soviet Union's hostage because of the intermediate and medium-range ballistic missiles poised in western Russia. For this reason, in weighing the *strategic* balance, one must consider Russian IRBM/MRBMs as strategic weapons in the same context with United States POLARIS and ICBMs.

As Red China moves into a position where it has an intermediate-range or medium-range ballistic missile capability of its own, Peking may similarly view Japan, Korea, Formosa, Southeast Asia, the Philippines, Indonesia, Pakistan and India, as its hostages. If these nations find themselves virtually defenseless against Peking's nuclear forces, they will inevitably drift—or be driven—into Communist China's power orbit. Thus, the sacrifices of American men-at-arms in Korea and Vietnam may ultimately prove to have been made for naught.

48. General Johannes Steinhoff, "NATO Crisis: A Military View," *Survival*, November 1966, p. 8.

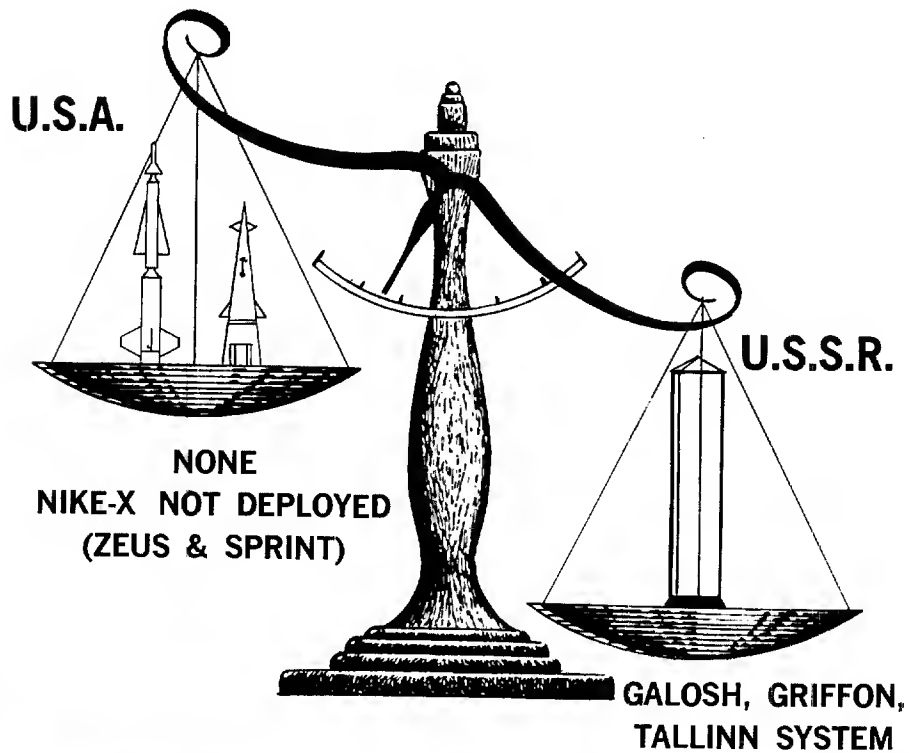
It has been reported that the United States has moved POLARIS submarines to the Western Pacific area. Presumably this is intended to counter the present Chinese Communist nuclear threat. However, this raises the interesting question as to whether Red China and the other Asian Communist countries consider the POLARIS submarines a real threat. In two wars in Asia since the United States obtained nuclear weapons, they have not been used. Indeed, American policymakers have made it abundantly clear that the U. S. would never use nuclear weapons against Communist aggressors in Asia. Although this policy might change if Red China develops a serious nuclear threat of its own, the United States' credibility with its Asian allies, at least so far as our will to use strategic weapons is concerned, has already been seriously damaged.

It is perhaps crucial to the future of the Free World in Asia that the Communist powers respect U. S. nuclear strength in the Pacific.

For the time being, however, it is obvious that Soviet IRBM/MRBMs constitute the greater threat to the Free World's security and, particularly, the security of Western Europe. Our NATO allies need positive reassurance that the United States still firmly intends to provide them with a nuclear umbrella against a possible Soviet attack. NATO has already been severely hurt, if not crippled, by the withdrawal of France from the military alliance. And there is strong evidence that President DeGaulle took this drastic step, at least in part, because of France's withering confidence in the credibility of our nuclear deterrent. Certainly, DeGaulle was not unmindful of the Soviet missiles aimed at his country when he ordered NATO forces from French soil.

ABM BALANCE

ANTI-BALLISTIC MISSILE



Chairman Khrushchev announced U.S.S.R. ABM capability in 1962. Long suspected by unofficial sources, the existence of a Soviet ABM System was confirmed by Secretary of Defense McNamara in November 1966. The extent of this system and its capabilities are unknown although Mr. McNamara asserts that offensive penetration aids would nullify it. What assurances does the Secretary have of this?

ANTI-BALLISTIC MISSILES (ABM)

USA	USSR
<p>NIKE-X (SPRINT and SPARTAN) Under development since 1965.</p>	<p>GRIFON—first displayed in Moscow in November 1963. Said by Soviets to be an anti-missile missile.</p> <p>GALOSH—first displayed in Moscow in November 1964. Described as an anti-ballistic missile.</p> <p>TALLINN—described as an anti-ballistic missile system.</p>
<p>Sample source: William E. Howard and James Barr, <i>Spacecraft and Missiles of the World—1966</i>. (New York: Harcourt, Brace, and World, Inc., 1966), pp. 83-84.</p>	<p>Sample sources: <i>Jane's All the World's Aircraft</i>, 1965-1966, p. 442; <i>Jane's All the World's Aircraft</i>, 1966-1967, p. 468; <i>Business Week</i>, January 14, 1967, p. 79; <i>The New York Times</i>, February 5, 1967, p. 1.</p>

Although both the United States Army and Air Force began studies for missile defense as early as 1955, the Office of the Secretary of Defense (OSD) did not authorize the NIKE-ZEUS program before 1957.⁴⁹ Preliminary tests on Kwajalein Island of Army's NIKE-ZEUS system against ATLAS ICBMs launched from the mainland proved successful in 1962. OSD, however, noted that NIKE-ZEUS could not discriminate between warheads and decoys where interception took place above the atmosphere from 50-to-200 miles out, and that decoys and other penetration aids were within the state of the art for engineers of the U.S.S.R. Thus NIKE-ZEUS was not put into production even though the Soviet Union did not have penetration aids at that stage. In other words, ZEUS would have been effective for a limited time until the U.S.S.R. had developed penetration aids but OSD believed a short effectiveness period would be impractical.

In 1963, the Army designed the NIKE-X system. This was to include the ZEUS and another missile, SPRINT, which would fire rapidly and intercept at close range (20-to-30 miles) those incoming warheads missed by ZEUS. It was conceived that lighter decoys would fall behind or burn up in the atmosphere and a new Multifunction Array Radar (MAR) system would be able to discriminate and handle many targets simultaneously.⁵⁰ This NIKE-X system has proved out in what tests could be run without actually exploding nuclear warheads in the atmosphere. Tests of SPRINT are still being made at White Sands. Still, NIKE-X has not been put into production, although about \$400-million each year (\$421-million in FY '68) for ten years has been invested in ballistic-missile defense, or \$4-billion.⁵¹ An advanced version of ZEUS, now called SPARTAN, with a 400-mile range, is now under development.⁵²

The U.S.S.R. displayed the GALOSH ABM in its case at a Moscow parade in November 1964.⁵³ It is believed to compare with NIKE-ZEUS. In October 1961, at the 22nd Party Congress, Marshal Malinov-

49. *Inquiry into Satellite and Missile Programs*, Hearings, Senate Preparedness Committee, 1958, Part I, p. 381.

50. *DOD Appropriations for 1965*, Hearings, Part 4, pp. 186-188.

51. *Posture Statement*, January 23, 1967, p. 47.

52. *Business Week*, January 14, 1967, p. 79.

53. *Ibid.*

they made the claim that the problem of destroying missiles in flight has been solved by Soviet scientists. In 1963, the GRIFFON, a short-range ABM was unveiled which has been said to compare with the United States SPRINT. Unofficial reports were frequent in 1963 of Soviet ABM deployment. By 1966, the reports were corroborated when Secretary of Defense McNamara announced on November 10, 1966, that the United States had "considerable evidence" that the Soviet Union had indeed deployed at least a limited ABM system.

In his annual Posture Statement to the Congress, the Secretary took cognizance only of "a deployment of an anti-ballistic missile defense system around Moscow."⁵⁴ In the published version of his statement, at least, he did not refer to what Hanson W. Baldwin, calls "the far more widespread (ABM) installations in other parts of the Soviet Union known as the TALLINN system."⁵⁵

According to Mr. Baldwin, "launching sites and radars of this system extend in a wide arc across the northwestern part of the Soviet Union covering the missile window, or angle or arc, through which United States missiles, launched from land bases, would have to approach their targets." In addition, he said, "installations of the TALLINN type have been discovered east of the Ural Mountains." He added that there were reports of more such installations "in the southern part of the Soviet Union in position to defend against attacks from the Mediterranean area."

Although there is a difference of opinion within the U. S. intelligence community on the type of missiles employed in these TALLINN-type systems, some experts believe the Soviets are probably deploying ABM weapons capable of producing "X-ray effects." Let loose by ultra-high energy nuclear explosions, pulsed X-rays cause "violent reactions within materials" that can destroy or neutralize attacking nuclear warheads. According to the publication, *Technology Week*, the shielding materials currently used to protect U. S. warheads would fail to offset the X-ray effect.⁵⁶

The policy of the United States, at this writing, is to defer deployment of an ABM system pending an appeal to Moscow by Ambassador Llewellyn E. Thompson for an agreement on a mutual moratorium on ABM deployment.⁵⁷

54. *Posture Statement*, January 23, 1967, p. 40.

55. *The New York Times*, February 5, 1967, p. 1.

56. *Technology Week*, January 2, 1967, pp. 10-12.

57. *The New York Times*, January 18, 1967, p. 3.

There is disagreement in the intelligence community over the extent and effectiveness of the Soviet ABM system. But there is no disagreement over the fact that the Russians have something and the United States has nothing.⁵⁸ Under these conditions the Soviet leaders will find themselves in a favorable bargaining position as they did during the Cuban missile crisis. That side with most negotiating capital is likely to come out ahead.

Even if deployment is finally ordered, the Administration in Washington is talking about a limited system costing from \$4-to-\$5-billion over a period of four or five years. This system would be specifically designed to defend against missiles aimed at the American long-range offensive system and would probably have little effect on saving lives.⁵⁹

ABM Deployment: Arguments Pro and Con

Some of the central arguments concerning the deployment of an anti-ballistic missile system are:

1. Against ABM

A principal argument used by the Office of Secretary of Defense (OSD) against a U. S. commitment to production and deployment of an ABM system is summed up in an ancient military rule, i.e., that the best defense is a good offense.

The OSD contends that offensive systems are cheaper and more effective in modern warfare than countervailing defensive systems. Missile penetration aids are far less expensive than an ABM. ABMs cannot defend everywhere because of the prohibitive cost and the terrible destructive capability of nuclear warheads but ICBMs can be targeted anywhere. Thus, the Secretary of Defense argues, the U. S. should devote its efforts and resources to improving offensive systems to deter potential enemies from attacking.

In his 1967 Posture Statement, Defense Secretary McNamara spelled out his position clearly: "It is our ability to destroy an attacker as a viable 20th Century nation that provides the deterrent, not our ability to partially limit damage to ourselves. . . . Once sufficient forces have been procured to give us high confidence of achieving our Assured Destruction Objective, we can then consider the kinds and amounts of forces which might be added to reduce damage to our population and industry *in the event deterrence fails.*" (Emphasis added.)

58. *Washington Star*, Richard Fryklund, January 11, 1967, p. A-20.

59. *Baltimore Sun*, January 25, 1967, p. 1.

Obviously, if deterrence fails *it is then too late to build an ABM*—too late for the 120 million Americans whom the Secretary estimates would be killed in such an attack.

The *only* deterrent value in our offensive weapons is the credibility an enemy places in our will to use them in defense, not merely of the United States, but of our Allies and our global interests generally. There is a serious question, which probably cannot be answered; unless and until, the Soviets conclude they are ready for an all-out attack or a final face-down, as to whether U. S. credibility has not already been seriously undermined by America's adherence to a "second-strike" policy. (See ICBM section for further discussion on this point.)

Despite our total strategic reliance on offensive weapons, the "second-strike" policy casts United States military posture in a fundamentally *defensive mold*. In the absence of an ABM, and with our offensive weapons restricted to a wholly defensive role, the danger of a general nuclear war is greatly increased. An enemy who knows he is guaranteed the advantage of a first strike that would, according to Secretary McNamara, kill 120 million Americans—and who has himself deployed an effective ABM that might cut his own losses to an acceptable level—might in the future be sorely tempted to attack America in the hope of winning "the final victory" with one massive blow.

In short, the argument that the best defense is a good offense is not applicable here because the U. S. has elected to take the defense. We have given the Soviet Union the first strike in the event of nuclear war. Yet we have no *defense* other than our threat to strike back. (See ICBM section for further discussion.)

2. Against ABM

The expense of the ABM is prohibitive, and at the very least, would place a tremendous strain upon the U. S. economy.

For ABM

Stretched over a ten-year period, the \$40-billion which OSD now estimates is required for a comprehensive ABM system would be only \$4-billion per year and could be readily borne by the American economy. Our total defense budget in 1967 will top \$75-billion with supplemental requests for the Vietnam War and the economy has still proved viable. Vietnam costs alone came to more than \$25-billion in 1966 and the stakes there do not begin to compare with the stakes in an intercontinental nuclear war which would kill tens of millions of our people.

Secretary McNamara has estimated that even a \$20-billion expenditure for deployment of NIKE-X, supplemented by a fallout shelter program, would save 70-to-90 million American lives and hundreds of billions of dollars in property.

It should be noted, however, that OSD's \$40-billion figure represents the "maximum feasible protection" in a total defensive system that includes \$5-billion for a fallout shelter program and a \$15-billion for beefing up the aging air defense system. It is argued that there is no point in guarding against one kind of attack if another kind of attack can get through. Nevertheless, these other expenses are not part of the ABM system any more than is a necessary ICBM system. The remaining \$20-billion would be for the ABM.

If \$20-billion over a period of ten years can protect 70-to-90 million lives, then the "insurance" cost for each year per individual protected would amount to \$67 per year, or about \$5 per month. Should one choose the \$40-billion figure, even \$10 per month seems cheap insurance for such protection.

It must also be noted here what several recent offensive weapons systems have cost. Building these was a burden which the United States bore without complaint: ICBM system: \$20-billion; POLARIS system: \$11.8-billion; B-52 system: \$8-billion.

3. Against ABM

An American commitment to build an ABM would accelerate the arms race, thereby reducing our security.

For ABM

The Soviets have already opted for acceleration, not only with their current deployment of an extensive ABM system but by increasing their ICBM force, and in the development and deployment of many other military components, including a nuclear submarine strike force capable of delivering missiles on American cities.

In this connection, it is interesting to note that on January 15, 1966, Charles M. Herzfeld, Director of Advanced Research Projects Agency in the DOD, told a European Study Commission conference in London that the U.S. argument against deployment of ABMs, (i.e., that it would accelerate the arms race) was "put to the Russians at least three Pugwash Conferences ago. On the first two occasions the Russians did not even understand the argument that there might be an advantage in not having a defense; the third time they said it was too late."

Secretary McNamara admits that "two significant changes have occurred during the last year in our projections of Soviet strategic forces. The first is a faster-than-expected rate of construction of hard ICBM silos; the second is more positive evidence of a deployment of an anti-ballistic missile defense system around Moscow."⁶⁰

The concomitant argument that an arms buildup would reduce U. S. security is difficult to understand. *Every* Soviet arms development which is not at least matched by a U. S. effort *reduces* our nation's security. Since we have made it abundantly clear that the U. S. will maintain a second-strike policy, there is no need for the present Soviet buildup—unless they intend to use their new strategic weapons for nuclear blackmail or a first strike.

4. Against ABM

U. S. deployment of an ABM would be a provocative measure which would heighten world tensions.

For ABM

It should by now be clearly understood that an ABM is a purely defensive system, particularly in the hands of a nation which religiously adheres to a second-strike posture. However, if a nation was indeed preparing for all-out war, it would naturally place a high priority on an effective ABM so that it could protect itself after delivering a first strike.

An ABM itself cannot logically be provocative. But, coupled with an offensive buildup such as the Soviet Union is now pushing, it could indeed increase world tensions, whereas a U. S. ABM effort would now tend to stabilize the strategic balance and ultimately *reduce* tensions.

During his February 1967 visit to Great Britain, Soviet Premier Kosygin openly defended the U.S.S.R.'s action in deploying an ABM on the grounds that a country has the right to provide for its own defense. If this argument were used by the United States, a non-aggressive nation, the logic of this view would be difficult to dispute. Used by a leader of a nation firmly committed to world domination, it certainly appears provocative.

Although an effective defense system strengthens any military posture by protecting the base from which offensive forays can be made, defensive systems that cannot threaten a potential enemy will not provoke an attack unless the adversary already has designs for conquest.

60. *Posture Statement*, January 23, 1967, p. 40.

Throughout history, defensive works and fortifications have tended to stabilize the political environment because they lend a sense of security to those behind the fortifications which makes it less demanding for them to destroy their enemies.

Today, America's continued emphasis on *offensive* strategic weapons does much more to strain world tensions than deployment of an ABM. As Soviet Major General Nikolai Talenski puts it, "only the side which intends to use its means of attack for aggressive purposes can wish to slow down the creation and improvement of anti-ballistic defense systems. For the peace-loving states, anti-missile systems are really a means of building up their security."⁶¹

By placing our sole reliance for deterrence on ICBMs, POLARIS and POSEIDON missiles, and the remaining manned bomber force, the United States places itself in the dangerous position of having only one option left if it is faced with a Soviet ultimatum to surrender. It must either fire its offensive nuclear weapons or give up its sovereignty. An ABM would at least strengthen the hand of the President if he were confronted with such a fateful decision, and it might well stay the hand of an enemy at a critical moment in history.

5. Against ABM

An ABM would be of little use without a concurrent fallout shelter program, which would also greatly burden the economy and frighten the American public.

For ABM

In his 1967 Posture Statement, Secretary McNamara says: "A significant amount of fallout protection exists today. By the end of the current fiscal year, we expect that this effort will have identified about 160 million shelter spaces. . . ." Although Secretary McNamara concedes that a "substantial portion of our population would still be left without adequate fallout protection," he adds that "much of the shortfall, we believe, could be met by making, *at little or no cost*, relatively minor changes in the design of new buildings."⁶² (Emphasis added.)

This "significant" present protection has been achieved with a relatively low expenditure for Civil Defense, an expenditure which the Secretary estimates at \$111-million for Fiscal 1968. However, to provide a really effective fallout shelter program the DOD previously esti-

61. *Technology Week*, March 27, 1967, p. 16.

62. *Posture Statement*, January 23, 1967, p. 63.

mated the cost at \$5-billion. Spread over the ten years needed to deploy the concomitant ABM system this would average out to about \$500-million per year. Certainly, this is a modest price tag to put upon a program that even *without* an ABM could save many millions of American lives, particularly when the U. S. is spending 50 times that amount annually on the Vietnam War.

As for the argument that an accelerated shelter program would frighten the public, it would seem that Americans would be far better off knowing the facts if ultimately their lives could be forfeited through ignorance and lack of preparation. For many years, the U.S.S.R. has *required* every Soviet citizen over 18 years of age to take intensive courses in Civil Defense. In comparison, the American effort is indeed puny.

In 1966, General Wheeler, Chairman of the Joint Chiefs of Staff, testified before the House Appropriations Committee that the Joint Chiefs favored *both* an ABM and a fallout shelter program. General Wheeler believed that a low-key approach, coupled with intelligent public education, would overcome the fears that might be associated with a shelter program.⁶³

6. Against ABM

We are not certain how far the U.S.S.R. has gone with its own ABM, which may only be intended as a defense against Communist China.

For ABM

The major U.S.S.R. ABM deployment is known to be along its northwestern borders, anchored on the Baltic city of Tallinn. This is in the path of the known route most American ICBMs would take in a retaliatory attack on the Soviet Union—*not in the path of any present or likely future strike from China.*

Secretary McNamara says that it “appears unlikely that the Chinese could deploy a significant number of operational ICBMs before the mid-1970’s, or that those ICBMs would have great reliability, speed of response, or substantial protection against attack.”⁶⁴ Is it possible that the Soviets view Communist China’s strategic threat with greater alarm than does our own Secretary of Defense? If so, America had better look to its own defenses and build an ABM system to intercept a possible attack from China.

63. House Appropriations Committee Hearings for Fiscal Year 1967, Part I, pp. 88-89.

64. *Posture Statement*, January 23, 1967, p. 42.

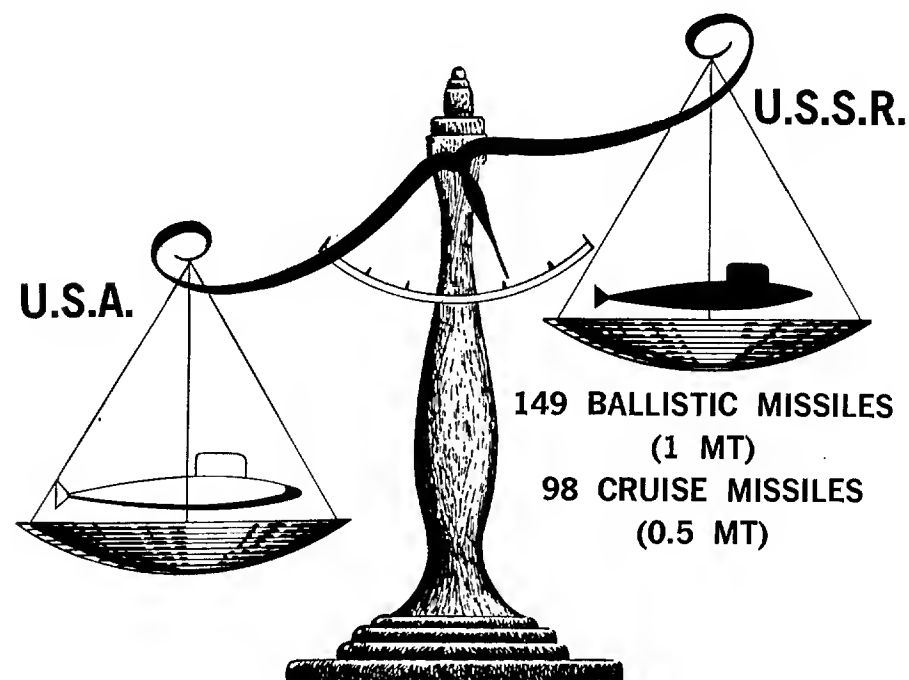
As to the extent of Soviet ABM deployment, the USSR "had progressed well beyond the deployment of ABMs around a major city or several cities; it had developed a comprehensive, advanced and expensive system. Even more important, the Soviet system is evidently not a 'point' defense system, but an 'area' defense system. It is geared, that is to say, not only to defend cities and concentrations of weaponry, but to protect military installations *that have already been widely dispersed. . . .*"⁶⁵

Moreover, Soviet leaders have repeatedly stated in public that their nation has an effective ABM. On April 23, 1966 United Press International reported from Budapest that Soviet Defense Minister Malinovsky claimed the U.S.S.R. had already "introduced" a defense system capable of intercepting whole squadrons of attacking bombers and knocking out incoming missiles.

65. *Triumph*, February 1967, p. 17.

SLM BALANCE

SUBMARINE-LAUNCHED MISSILES



208 POLARIS 2 (.7 MT)

448 POLARIS 3 (.7 MT)

Note: The U.S. SLBM System is more sophisticated than the U.S.S.R. System. However, the U.S. System is a counter to the 750 Soviet IRBMs. Considering that about 50% of the U.S. Force is kept on station, this amounts to 352 Polaris missiles, only 22 of which might be fired at one time.

SUBMARINE-LAUNCHED MISSILES (SLM)

U.S.	U.S.S.R.
208 POLARIS 2 (0.7 MT) 448 POLARIS 3 (0.7 MT) Total deliverable warhead yield: 460 MT	149 Submarine-launched ballistic missiles (1 MT warheads) 98 Submarine-launched CRUISE missiles (0.5 MT warheads) Total deliverable warhead yield: 198 MT

Sources:

Jane's Fighting Ships 1966-67, pp. 433, 434.
The Military Balance 1966-1967, Institute for Strategic Studies, London, 1966, pp. 5, 25.
Military Review, June 1966, pp. 105-108.

D. SUBMARINE-LAUNCHED MISSILES (SLM) AND
ANTI-SUBMARINE WARFARE FORCES (ASW)

U.S.S.R. SLM Capability

A move to the sea is in progress for the Soviet Union's rocket forces as a part of the U.S.S.R.'s determination to gain domination in hydro-space, precisely as it seeks supremacy in aerospace.

From an examination of *Jane's Fighting Ships 1966-1967*, it is clear that the U.S.S.R. plans to use submarines as launching platforms for a substantial portion of its missile arsenal. Indeed, as Captain H. B. Sweitzer, USN, has pointed out in the *Proceedings* of the U. S. Naval Institute (September 1966), "Seventy-seven Soviet (missile-firing) submarines, both conventional and nuclear-powered, are in operation, including 10 "E" class, 13 "H" class, two "J" class, 30 "G" class, 10 "Z" class, and 12 "W" class; each carries from two-to-six guided or ballistic missiles." *Jane's Fighting Ships 1966-1967*, also reports that an additional 30 submarines are under construction in Soviet dockyards."⁶⁶

The "H" type submarine for example, is a nuclear-powered ballistic missile type, with a displacement of 3,500 tons. Armament consists of three ballistic missile tubes for missiles with a reported range of 600-to-3,000 miles.

Space/Aeronautics concludes: "For the present, with all its various limitations, the U. S. Navy's attack submarine force is in generally better overall shape than the U.S.S.R.'s, as nearly anyone this side of Moscow can figure. Yet the intentions of the Soviet Union are clear: to wipe out our present lead in submarine technology; to threaten the POLARIS-POSEIDON strategic deterrent; to interdict both our commerce and our naval power by its submarine force should it come to war."⁶⁷

This journal also pointed out, that while what the U. S. knows about the Soviets' nuclear submarines "is very sparse," it is possible to project certain characteristics from knowledge of submarine technology. If the Soviet submarines aren't as good as U. S. craft yet, the journal said, "they certainly can become that good."

66. *Jane's Fighting Ships 1966-1967*, pp. 433, 434.

67. *Space/Aeronautics*, July 1966.

In appraising the Soviet seaborne missile threat, the overall Soviet effort at sea should be taken into consideration. Paralleling the Soviet rocket effort of the 1950's and 1960's has been an enormous oceanographic program. To conduct successful submarine missile attacks, Soviet naval commanders require detailed information of the sea bottom in critical areas. Indeed, it long has been believed, and frequently reported, that the Soviets have marked the sea bottom in certain places as possible firing points. While the under-ice operations of certain American submarines, notably the SKATE, have received widespread attention, it should be appreciated that the Soviets have been studying Arctic navigation for decades. One danger is that Soviet submarines, intent on making missile attacks against the North American continent, would enter Hudson's Bay which would enable them to make a deep penetration of the continental land mass.

Any appraisal of the Soviet submarine missile threat should not downgrade the menace because of the limited range of the U.S.S.R.'s submarine-launched missiles. On the west, the Soviet Union can only be approached through narrow or arctic waters. Thus it is necessary that U. S. missiles have a greater stand-off capability, whereas the Soviets, could be expected to employ their missiles in a first strike, and could deploy their submarines close to the shores of the United States.

It should be borne in mind that the military applications of hydro-space are only beginning to be made. Even as satellites in space offer a potential for military action, the seabed offers opportunities for launching platforms of the future. The advanced nations currently are developing deep submergence technology which will enable men to live and work at great depths. This will lead, initially, to undersea mining and oil drilling beyond the continental shelf—on submerged lands which have no sovereign claims at present. It also will lead, one can be sure, to the development of missile-firing bases on the seabed.

The United States needs to look ahead, both in terms of submarine technology and the law of the sea, to undersea defense zones from which Soviet submarine forces would be excluded.

Space/Aeronautics has observed that "looking toward the future of submarine warfare, submariners feel that the force in being in the late 1970's may include small reconnaissance craft, and 'bomber' types even larger than the 425-foot LAFAYETTE class of FBM boat. Armament may include more sophisticated missiles and torpedoes; the 'bomber' types may operate with drone escorts. Ocean-bottom armories and fueling stations, and fixed-site (or crawler-mounted) launch platforms, may

also be part of tomorrow's undersea force.⁶⁸ Obviously, the United States cannot permit the Soviet Union to have superiority in such under-sea strategic weapon systems. This is all the more true in that, at this time—as The Institute for Strategic Studies has noted—missile-bearing submarines have an increasingly important role in Soviet strategy.

Many Russian submarines and surface ships, it should be noted, carry air-breathing missiles with a range of about 300-to-500 miles.

The Soviet Union has 46 submarines which carry 149 ballistic missiles and 17 submarines which carry a total of 98 CRUISE missiles.⁶⁹

The United States, of course, is precluded from destroying Soviet submarines in peacetime. During the Cuban missile crisis we were made aware of Soviet submarines cruising near United States shores. If they had been firing missiles, their mode of attack would probably have been to surface at night, fire their missiles, and quickly submerge. In a peacetime environment they would not have been subject to attack until they had taken the act of war by firing their missiles.

We can take little comfort in the fact that Soviet SLMs are of shorter range than our POLARIS missiles. Ours must be long-ranged to reach Russian targets, while Soviet vessels can approach well within range of the principal coastal cities of the United States. Also, the new Soviet submarine-launched ballistic missiles have a range comparable to our POLARIS.

United States SLBM Capability

When the last of the 41 POLARIS submarines is operational in the early fall of 1967, the United States will be in a position, theoretically, to deploy a total of 656 POLARIS missiles at sea—or 16 per submarine. Due to overhaul and refit, however, only 22 POLARIS submarines will be on station at any one time, or, an actual figure of 352 POLARIS missiles available for launch. Seven of the 41 boats will be assigned to the Pacific, according to latest reports, and the rest will be on duty in the Atlantic and Mediterranean. Thirteen submarines are equipped with the A-2 missiles, and the remainder with the A-3 missiles. The latter is a rocket with a range of 2,500 miles, and will have superior accuracy. L. Edgar Prina, editor of *NAVY Magazine*, reports that the A-3 “is believed capable of carrying a warhead of one megaton or an equivalent of one million tons of TNT.”

68. *Space/Aeronautics*, July 1966.

69. *Jane's Fighting Ships 1966-1967*, pp. 433, 434.

The Secretary of Defense has announced that \$5-billion will be devoted to the POSEIDON submarine-launched missile. This will cover development of the missiles and fitting them in some of the nuclear-powered FBM boats.

With only 22 POLARIS submarines actually on station at any one time, the United States which has, after all, a four-ocean defense responsibility can hardly be said to have a fully adequate at-sea missile force. A reasonable number of POSEIDON submarines on station in the Indian Ocean would, for example, not only enhance U. S. deterrence of a nuclear war but would create an additional heavy burden to the Soviet ASW effort and might force them to withdraw ASW units now deployed in the Atlantic and Pacific and thus move them further away from U. S. shores.

ANTI-SUBMARINE WARFARE FORCES

Even as advocates of aerospace preparedness insist on prompt deployment of an American ABM defense and development of a military capability in space, so do students of seapower emphasize the need for swiftly augmenting U. S. anti-submarine warfare forces to deal with the growing Soviet undersea threat.

The Soviet position with respect to sea warfare was first enunciated at the Communist Party Congress of 1956 when Marshal G. Zhukov stated: "In a future war the struggle at sea will be of even greater importance than it was in the land war." In the decade since that statement was made, the Soviet Union (a land power by tradition) has embarked on massive programs aimed at upgrading all aspects of its sea power. These programs have massive merchant ship construction, full utilization of fisheries vessels, combination of the former separated Black Sea, Baltic and Northern fleets into a single high seas fleet, establishment of a powerful task force in the Mediterranean, and—most significantly—the crash drive for a missile-firing nuclear submarine force.

Not only has the Soviet Union pushed ahead with missile submarines, but it has developed nuclear attack submarines for anti-submarine warfare purposes. Typical of these new boats is the "N" class sub—LENINSKY KOMSOMOL 270. This is a fast (30 knot) nuclear-powered fleet submarine designed as a hunter-killer. It is armed with 21-inch torpedoes which are launched through six bow tubes. Such craft undoubtedly would be employed against American missile-firing submarines, if the latter could be detected.⁷⁰

⁷⁰ *Jane's Fighting Ships 1966-1967*, p. 433.

Dealing with the danger of Soviet submarines has long been a high-priority concern of the United States. To this end, the U. S. in the 1950's stepped up its oceanographic research and refined the techniques of searching for submarines by helicopter-lifted sonar and by airborne sensors. In both the 1950's and 1960's, the U. S. Navy also emphasized development of stand-off weapons as well as detection devices. The ASROC anti-submarine rocket is now in general use, and gives surface ships a nuclear punch—if the enemy submarine can be located. However, its effectiveness today lies in the fact that it uses a non-nuclear MARK 46 torpedo, which has been shown to be effective against submarine targets. Other advanced detection devices and weapons include the SQS-26 Sonar and a Variable Depth Sonar, plus new torpedoes and drone helicopters. Destroyers are specifically configured for ASW, and the Navy continues to build special anti-submarine escort ships.

The devices available for detection of conventional diesel boats include sonobuoys dropped from carrier-based aircraft and magnetic anomaly detectors. But ASW commanders generally admit that these devices are, at present, grossly inadequate against fast, deep-diving, nuclear-powered submarines.

In rough weather, the “nukes” are well able to run away from surface attackers. Airborne detection systems now in operation cannot pinpoint a nuclear submarine. It is now agreed, therefore, that the most effective means of dealing with Soviet nuclear submarines is another submarine, though the U. S. has a valuable aid in fixed long-range submarine detection systems in the Atlantic.

At present, however, the Navy's force of attack submarines—submarines designed to fight other submarines—is a mixed diesel nuclear force of only 105 boats. Seventy of these boats are of basic World War II design, with improvements. They provide excellent submerged listening platforms, but cannot deal with nuclear subs on a competitive basis. By fiscal 1969 there will be 64 effective SSNs authorized. Even more significant, however, is the fact that the projected 64 SSN force would be thin indeed in view of the multitude of Soviet missile-carrying surface ships and the large and growing Soviet merchant fleet ships all of which would constitute targets in the event of war. And these would necessarily be targets for a submarine force operating in Soviet-controlled waters where our submarines would be able to operate only in a war situation.

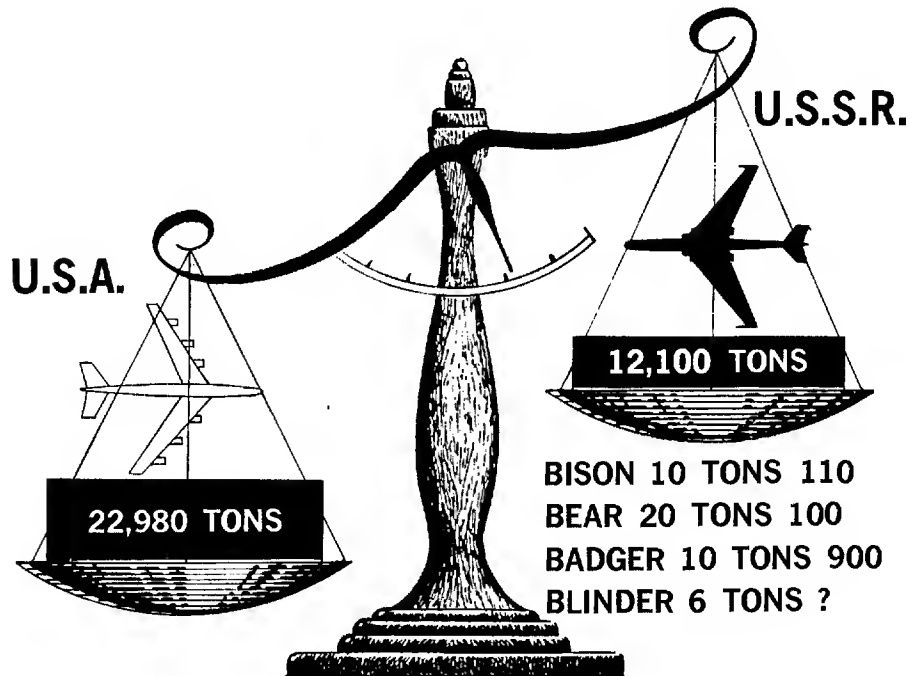
This force is meager, especially in view of the need to divide the force between the Atlantic and the Pacific. The SKIPJACK class boats are the fastest in the world, with an estimated top speed of close to 40 knots; but these and other attack boats are few in number.

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The limited size of the presently programmed attack submarine force is all the more disturbing in that changes in surveillance of the oceans almost certainly will produce the need for boats which can operate at vastly greater depths. New passive sensors which can observe radiation in all portions of the electromagnetic spectrum may, in the future, enable reconnaissance satellites to "see" submarines operating at current depths. The deep submergence of submarine forces is desirable because of the problems it raises in the enemy's ASW effort. With the need for true deep-diving submarine forces will come a parallel need for missile weapons capable of being fired from the depths. The U. S. Navy has pioneered SUBROC, a nuclear rocket for use against sub-surface targets. But naval commanders would like to see SUBROC equipped with an airburst-nuclear warhead.

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STRATEGIC BOMBER BALANCE



B-52 37.5 TONS 600

B-58 6 TONS 80

Note: Bomb load of each type is noted in tons of conventional bombs normally carried by that type of bomber. The total tonnage is that which all strategic bombers in the national inventory could carry at one time. Converted to nuclear yield, the figure would be higher by a factor of 1,000,000 or more. The Soviet conversion factor—that is, their nuclear explosive yield/weight ratio—is higher than that of the U.S.

STRATEGIC BOMBERS

U.S.A.		U.S.S.R.	
	Payload (lbs.)	Aggregate Payload (lbs.)	Aggregate Payload (lbs.)
600—B-52's	75,000	45,000,000	110 BISON 20,000 2,200,000
80—B-58's	12,000	960,000	100 BEAR 40,000 4,000,000
			900 BADGER 20,000 18,000,000
			? BLINDER* 12,000
680	Totals	45,960,000	1,110 Totals 24,200,000

SOURCES

Department of Defense Appropriations for 1967. Hearings before the Subcommittee of the Committee on Appropriations. 89th Congress, 2d Session, 1966, Part 1, (Washington: Government Printing Office, 1966), p. 55.

Aviation Week and Space Technology. Forecast and Inventory Issue, March 6, 1967.

The Military Balance—1966-1967.

London, Institute for Strategic Studies 1966, pp. 2-5, 25.

Secretary McNamara's "Position Statement" released by the Department of Defense January 26, 1967, credits U.S.S.R. with only 155 "intercontinental bombers."

* The 900 figure for BADGERs includes some BLINDERs which are considered replacements for the BADGERs.

E. STRATEGIC BOMBERS

The Soviet Bomber Force

The Soviet Union has the numerically largest strategic bomber force in the world today. This is because the U.S.S.R. has retained its air-refuelable medium bombers (900 BADGERs and BLINDERs) while the United States has scrapped a large force of over 1,000 B-47's. Thus the Soviets now have 1,110 strategic bombers versus 680 United States strategic bombers.

This change in the balance of U.S.-U.S.S.R. strategic bomber forces represents a reversal of the United States' former numerical preponderance in manned bombers, and poses a threat to the United States which is largely overlooked because the spotlight has been focused on the ICBM threat.⁷¹

The Soviet strategic bomber forces are composed of the following types and numbers of aircraft:⁷²

About nine hundred Soviet Air Force BADGERs (TU-16). Operational since 1955, the BADGER is a twin-turbojet subsonic medium bomber similar to the former U.S. B-47 and equipped for in-flight refueling. The BADGER has a bomb load capacity of 20,000 pounds and some versions carry the KIPPER standoff nuclear missile, with a range of 450 miles. The BADGERs are expected to be replaced by the BLINDER (TU-22) which has supersonic capability and a bomb load capacity of 12,000 pounds. The BLINDER was operational in 1962 and carries a KITCHEN air-to-surface missile. A few BLINDERs are included in the above estimate of the BADGER force.

One hundred and ten BISONs (M-4's). Operational since 1956, this four-engine turbojet bomber is comparable to our long-range B-52. It has a bomb load capacity of 20,000 pounds.

One hundred BEARs (TU-95). This is a huge four-engine turbo-prop bomber with a range of 7,800 miles. Its commercial version, the TU-114, is the largest aircraft in the world. A BEAR-type aircraft flies

71. Major Arthur J. Ruppert, USAF, "The Soviet Long-Range Bomber Force," a thesis submitted to the Air Command and Staff College, June 1965, *Space/Aeronautics*, November 1966, p. 63.

72. *The Military Balance* Institute for Strategic Studies, 1966, pp. 3, 44.

a weekly Moscow flight from Moscow to East Berlin reporting passengers and freight. First operational in 1956, the BEAR has a bomb load capacity of over 40,000 pounds and carries a KANGAROO standoff missile.

Despite pronouncements of Soviet officials that the bomber is obsolete, it appears that bombers still play a major role in Soviet strategic planning. Marshal of the Soviet Union, V. D. Sokolovsky has written that the long-range bomber force would "deliver blows" after a first strike by Soviet ICBMs. Air-to-surface missiles would be used first in the attack, launched from a point beyond the range of anti-aircraft fire.

The U. S. Bomber Force

The United States has phased out all of its medium B-47 bombers and retains an aging force of 600 B-52's and 80 B-58's.⁷³ Air Force planners had expected to replace obsolete strategic bombers with more modern counterparts such as the supersonic B-58's and the XB-70, but these plans were discarded as the result of unfavorable OSD cost-effectiveness studies. The requirements for an Advanced Manned Strategic Aircraft (AMSA) continues to be advanced by the United States Air Force to provide strategic flexibility and optimum options for deterrence or retaliation.⁷⁴

Current Department of Defense philosophy considers the manned strategic bomber to be "provocative" for two main reasons: First, it is thought vulnerable to surprise missile attack when sitting on an airbase. In order to use it at all, it must be launched before the enemy missile strikes. Thus, it hints of a "first strike" strategy. Second it is believed that the bomber is subject to less positive control than are missiles and may attack without authority through accident or madness of its crew.

These two philosophical objections to bombers by modern defense strategists have probably affected the objectivity of cost-effectiveness studies. Few military planners accept the "provocative" argument and the Joint Chiefs of Staff have always approved of a follow-on bomber, the AMSA. Some point out that strip and air alerts will reduce vulnerability probably to the degree available for hardened sites or POLARIS missiles, and that the "accident" or "madness" arguments, if

73. Hearings on S.666 before Joint Session of the Senate Armed Services Committee and the Senate DOD Subcommittee on Appropriations, January 24, 26, 27, 30, 31, February 1 and 2, 1967, pp. 835, 836.

74. House Appropriations Committee Hearings on the Department of Defense, 1967; Part I, pp. 518, 525-528.

Other arguments used against the AMSA are:

1. Their relatively long time of flight as compared to the ICBM.

Rebuttal: This is being cut down with advances in hypersonic flight and could be made comparable to ICBMs with SKYBOLT-type, stand-off missiles. With a long-range standoff missile, the AMSA would become as invulnerable an IRBM launcher as the POLARIS submarines.

2. Vulnerability to SAM missile defenses.

Rebuttal: Experience over North Vietnam has indicated that SAM missiles have been highly over-rated in past cost-effectiveness studies. Against low-flying aircraft using evasive tactics and others countermeasures, SAM-2 missiles have had less than a 6 percent effectiveness. SAM-3 missiles now guarding Russia, but not yet in North Vietnam, may be more effective. New countermeasures carried on an AMSA could reduce SAM accuracy still more.

Arguments for the AMSA include:

1. The AMSA's broader operational flexibility will provide a spectrum of strategic options. It can attack on an infinite number of unpredictable flight patterns, high and low, thus making enemy air defense extremely costly. It would outflank any Soviet anti-ballistic missile system and penetrate where missiles might be stopped.

2. Over friendly territory, aircraft are the least vulnerable of any strategic vehicle and can only be attacked by long-range interceptors which do not now appear in the Soviet inventory.

3. AMSA would provide a reaction to crisis, *short of an actual nuclear attack*. AMSA can be launched on alert and recalled; ICBMs must proceed to the target once they have been launched or be destroyed in flight. AMSA thus provides a strong psychological *tour de force* in crisis management.

4. AMSA can deliver nuclear weapons with greater discrimination and more last minute corrections than can ICBMs thus reducing the probability of unnecessary population destruction and permitting tighter, more effective crisis management.

5. AMSA can carry exotic sensors and collect invaluable reconnaissance information for relaying to command posts. The best of these sensors is the human eye backed by human intelligence and utilizing electronic and optical aids. Human faculties are not found in ICBMs or reconnaissance satellites.

6. Rapid intelligence feedback is possible with an AMSA. In a fast-moving nuclear war neither side will know who is winning without AMSA. The manned strategic vehicle is protected at all times by the infinite capabilities of human judgment which can perceive and react instantly to unprogrammed enemy deceptions or other unforeseeable events where a spot decision may mean the success of the mission. The acknowledged value of a man-in-space program for overcoming mechanical malfunctions is illustrative of the validity of maintaining human control over strategic weapon systems.

With the continued thinning-out of continental radar systems and air defense aircraft, the United States is being exposed to attack by Russian airbreather weapon systems as a follow-on to a first-strike missile attack. The only Improved Manned Interceptors (IMI) under development, but *not* scheduled for procurement, are F-12's built around a larger SR-71 airframe.⁷⁵ Present flying and radar equipment is becoming obsolete and is wearing out.

The Soviet Union, on the other hand, is modernizing its strategic bomber force with supersonic, medium-range BLINDERS and continues to deploy an extensive air defense system. The possibility of replacing B-52's with the 210 FB-111's, as proposed by Secretary McNamara (a modification of the TFX variable-wing fighter built by General Dynamics) in the 1970's, will be a stop-gap measure because of the inability of such a small bomber to carry adequate sensing devices, navigation equipment and penetration aids—not to mention its light bomb load and relatively short range without refueling. In any event, the Soviets would still retain their numerical superiority after the full deployment of the FB-111.

Secretary McNamara neglects to consider Soviet medium bombers in the number of 155 Soviet intercontinental bombers listed in his Posture Statement of January 23, 1967. Yet, 900 BADGERs are assigned to the Soviet strategic air command and with in-flight refueling, they have an intercontinental range. It is reasonable that they be considered in this strategic category as were the United States' B-47's before their phase-out.

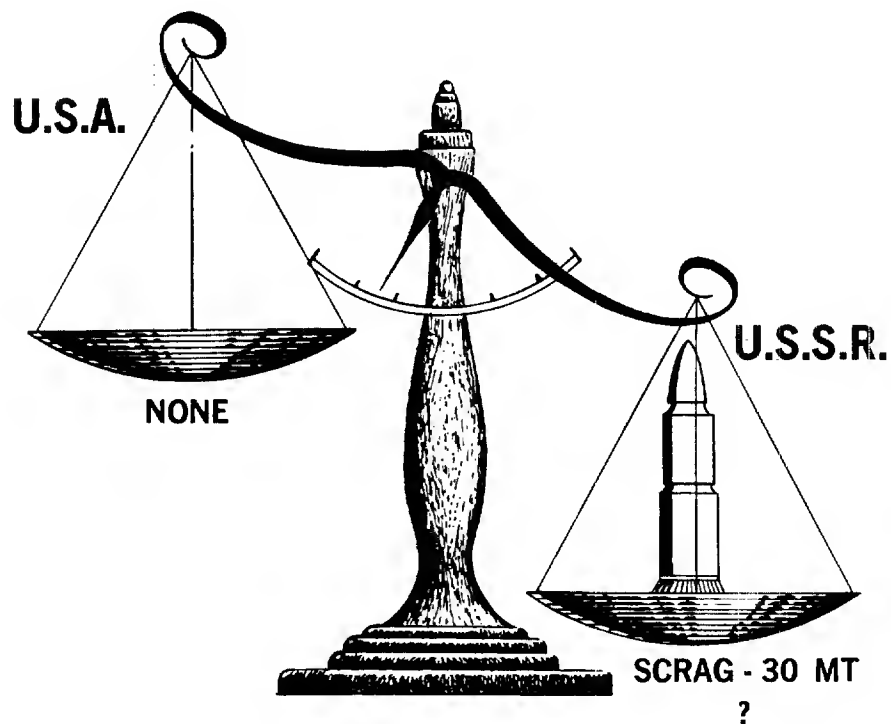
It might be noted that perhaps all the BADGERs do not carry bombs and that some would be used for in-flight refueling. This would reduce the overall bomb payload capability of the total force. But it still leaves the BADGER as a formidable force to be reckoned with

75. *Washington Post*, January 20, 1967.

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~~App one that certainly should not be arbitrarily removed from the~~
strategic balance.

The explosive power carried by the respective bomber forces is a more accurate measure of their respective strengths. On the basis of bomb loadings measured by weight of bombs carried, the United States has nearly a 2-to-1 advantage with 22,980 tons for the U. S. and 12,100 tons for the U.S.S.R. However, the Soviet advantage in yield/weight ratio for nuclear bombs (see ICBM section) would give them parity in delivery capacity as measured in megatonnage.

SPACE WEAPON BALANCE



Note: Soviet leaders have publicly noted that the U.N. Resolution against space weapons does not deny the development of such weapons and the Soviets have frequently boasted of their capability to employ orbital nuclear weapons, the Scrag, specifically. Nonetheless, the U.S. has not developed a military capability in space though the Gemini series clearly shows it could do so.

SPACE WEAPONS

U.S.A.	U.S.S.R.
NONE	SCRAG Shown in Moscow 1965 Capable of delivering a 30 MT war- head from fractional orbital or or- bital trajectory.

Sources:

The Military Balance 1966-1967, ISS, 1966, p. 2.

Military Review, November 1966, p. 106.

F. SPACE WEAPONS*

The United States Program

The United States has conscientiously avoided the development of space weapons and has been the leader in resolutions and agreements to ban weapons of mass destruction in space. It is generally held that ICBMs which enter space on a ballistic curve are not space weapons, but rather that orbital weapons alone apply to the space category. The Soviet Union's designation of "global" rockets which follow Keplerian elliptical trajectories the long way around the earth, (but short of a full orbit) have not been designated as space weapons, yet would logically appear to be so.

When the successful rendezvous of GEMINI 6 and 7 demonstrated, in small part, the great military potential of space, the Department of Defense officially ruled out any idea of a strategic weapons system involving satellites with nuclear warheads.

"There are two reasons for this, the Pentagon stated: U. S. defense experts insist that better accuracy, reliability, and warhead load can be obtained with long-range ballistic missiles; and there is agreement between the major nuclear powers not to use satellites as weapons."⁷⁶

The American space effort is one of civilian exploration in the interest of science under the National Aeronautics and Space Administration (NASA). The United States, to date, has spent some \$30-billion on its space effort. Of this total, some \$9-billion has gone into military space programs. This does not include any space weapons systems or even their development. NASA's ultimate goal is to land men on the moon rather than to exploit the region near earth for military purposes. The DOD's position is that there is "no requirement" to put military men in space.⁷⁷ In fact, the United States halted its promising DYNA-SOAR development in December 1963. The military Manned Orbital Laboratory (MOL) will not be launched before 1968. American military satellites are for reconnaissance, for missile-launch warning, for communications, for precise navigation, and for weather reconnaissance. Thus, as far as United States satellites are concerned, they are all defensive; none are offensive.

* See also the Space part of the Strategic Objectives section of this study.

76. Associated Press dispatch dated Washington, December 17, 1965.

77. *U. S. News and World Report*, June 21, 1965, p. 42.

In the Soviet Union, space programs are run entirely by military men with military goals foremost in mind. Several official Soviet sources claimed explicitly in connection with the display of a 3-stage missile in the Bolshevik Revolution Day parade on November 7, 1965, that they now possessed a "monstrous new terrible weapon." Both TASS and *Izvestiya*⁷⁸ described it substantially as an "orbital missile [whose] warheads can deliver their surprise blow on the first or any other orbit around the earth." This weapon has since been code-named SCRAG. Stress was laid on the capability of the new weapon "delivering its blow unexpectedly."⁷⁹ The May 1965 issue of *Ogonock*⁸⁰ contained an article describing the perfection of an orbital missile capable of carrying a 100-megaton warhead. Unclassified sources give the orbital version of SCRAG a 30-megaton warhead.⁸¹ The Chief of the Soviet Air Force, Konstantin Vershinin, said in 1964, that the Soviet Union is developing space craft that could take-off and land at any airfield and "could knock out any foe."⁸² This sounds much like the cancelled U. S. DYNA-SOAR, and if true, points the Soviet Union far ahead in the military man-in-space program.

Effectiveness of Orbital Bombs

What are the advantages and disadvantages of orbital nuclear weapons compared with ICBMs or other delivery vehicles of nuclear warheads? First, delivery time for weapons in orbit, assuming the weapon is over the intended target area, is much less. Consequently, under certain controlled conditions, the reaction time available to the defending power may be cut significantly from about 15 minutes for an ICBM to from four-to-six minutes for an orbital missile.

The ground-based ICBM, on the other hand, is considered to have three advantages over orbital bombs: (1) numbers available for firing, (2) accuracy, (3) positive control. A large number of orbiting spacecraft might bring on a war that home-based ICBMs would not. Many officials also point out that the orbiting weapon is at a disadvantage because it must be near the target area to be a faster-firing weapon

78. *Izvestiya*, November 8, 1965, p. 2.

79. United Press International dispatches, dateline Moscow, November 8, 1965 and November 11, 1965.

80. *Ogonock*, No. 20, May 1965, pp. 6-7.

81. *The Military Balance 1966-1967*, (London: Institute for Strategic Studies, 1966), p. 44.

82. *The New York Times*, August 18, 1964, p. 17.

than the ICBM. A normal orbit takes about 90 minutes. So an orbital weapon might be half way around the world or 45 minutes plus de-orbiting time from its target when ordered to fire. An ICBM, on the other hand, although it may take longer to travel (32 minutes to strike a target 10,000 Km. away) is always the same distance away and hence more predictable.

Those who counsel against development of an orbital bomb by the United States also say it is less accurate than ICBMs. This is illustrated by the de-orbiting of astronauts in their re-entry capsules. It should be pointed out that the accuracy of de-orbiting American astronauts has been increasing in each of the GEMINI flights and can be expected to continue to improve. Little has been stated publicly about the accuracy of de-orbiting Soviet launches, but it is generally conceded that the Soviet Union has a sophistication comparable to that of the United States.

Orbital nuclear weapons systems can be used in other ways. A nuclear bomb of high enough yield, detonated in space while still in orbit over a target area, could be a devastating prelude to an ICBM attack. A possible effect of such a very high-yield weapon exploded in space would be the searing of a large area of the earth beneath. American scientists have stated that the Soviet Union is, in fact, capable of producing 100-megaton weapons, as she claims. There can be little doubt that its boosters have the capacity to orbit a bomb of this size or even larger. The Soviet BIG BROTHER booster demonstrated its ability in 1965 to put a 13.5 ton payload in orbit.⁸³

The heaviest object orbited by the United States was a 21,000 pound satellite launched by a TITAN III-C rocket. The non-military SATURN V, due to become operational in 1967, will have a thrust of 7.5-million pounds—over three times as powerful as the TITAN III-C.

An orbital high-yield detonation would certainly impair communications to some degree and possibly damage the United States' offensive missile system over a wide area. It has been publicly acknowledged that the space tests by the United States from Johnston Island in 1957 and 1958 blacked out most communications in the Pacific for an hour or more.⁸⁴

Thus, if the Soviet Union chose to use orbital nuclear weapons in conjunction with a first strike with ICBMs, the orbital weapons could

83. *U. S. News and World Report*, August 30, 1965, p. 25.

84. William E. Howard and James Barr, *Spacecraft and Missiles of the World—1966*, (New York: Harcourt, Brace, and World, Inc., 1966), p. 41.

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well cripple the United States "second-strike" capacity by disrupting communications necessary to retaliate, or by other phenomena such as heat, blast and various electromagnetic effects.

If the Soviet Union is developing the option of orbital nuclear attack, it is unlikely that launching of orbital weapons would be announced as such. Orbital rockets could be launched under various covers, as scientific satellites, space explorations, or manned satellites if the planned attack were imminent.

If the United States were to discover that the Soviet Union had been indeed launching nuclear weapons into space orbit, there would be two experimental weapons designed to knock them out: a THOR modification and a NIKE-ZEUS based on Johnston Island and Kwajalein in the Pacific. Yet, there are some possible orbits from Soviet Union launch sites which would be out of range for these two weapons. In 1964, it was reported that the Soviet Union launched two satellites in orbits which would take each over Johnston Island and Kwajalein. This occurred shortly after the Presidential announcement of the United States' anti-space weapons.⁸⁵

A prerequisite to attacking a Soviet satellite in space, of course, would be verification that it was actually carrying a nuclear weapon. Shooting down a peaceful manned or scientific satellite would probably be considered a provocative act of war unless it occurred over friendly territory. If, however, it were widely believed that a nuclear payload was truly in orbit, the country which destroyed it would be applauded by all the other countries over which the orbital bomb had traveled.

That the Soviet Union would dare to risk the deployment of orbital bombs is at least credible in view of experience during the Cuban missile crisis. Surprise would be complete since the United States has no way of determining if an orbital vehicle is bearing a nuclear weapon. Surprise is also possible with the so-called global Soviet rockets which could attack from over the South Polar regions and completely out-flank America's continental Ballistic Missile Early Warning System (BMEWS).

The Soviet Union could hint that certain orbiting craft were capable of immobilizing our ICBM system. Combined with a means of countering the American POLARIS missile force, this might be the ultimate nuclear blackmail.

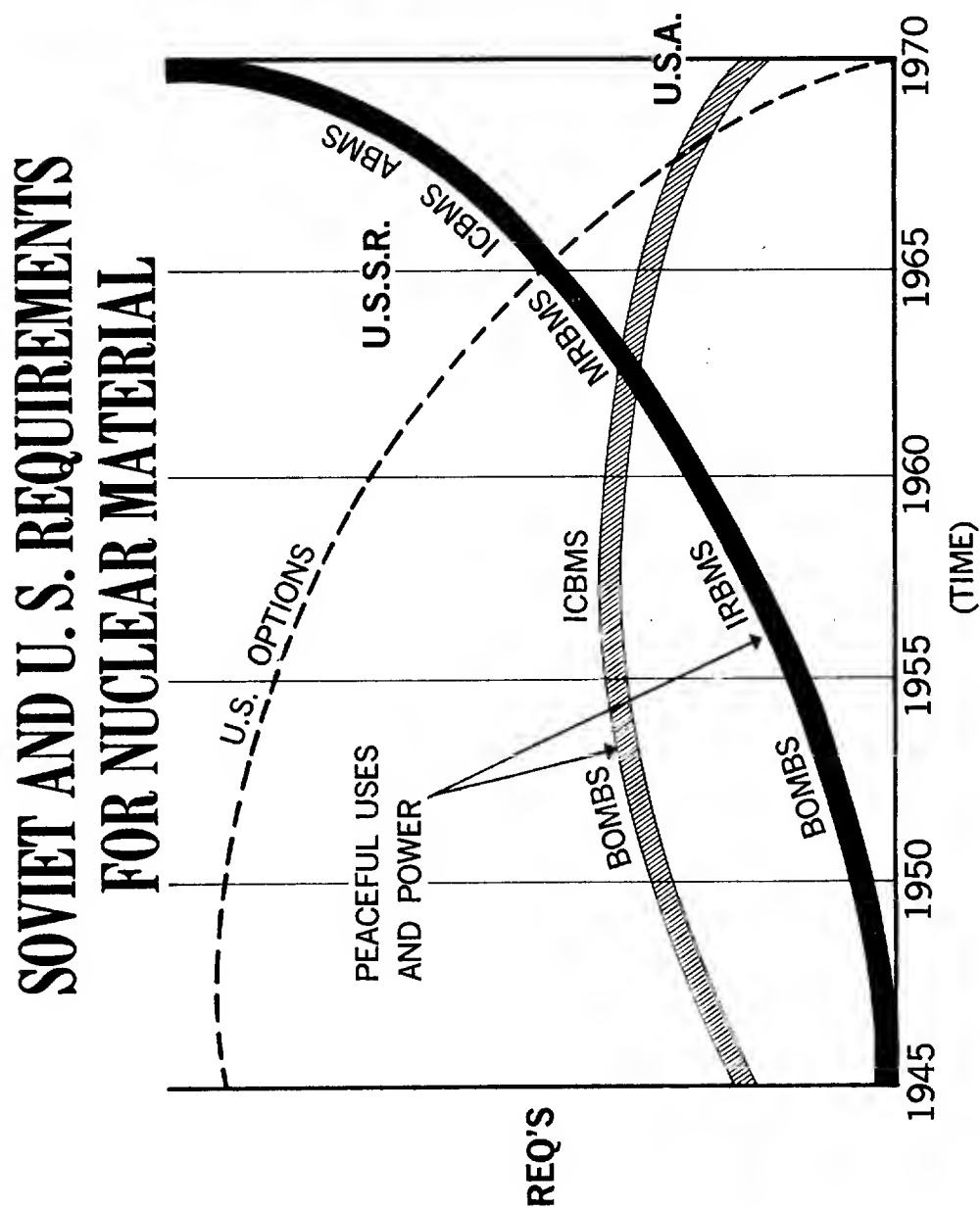
In the United States we argue variously that space offensive nuclear delivery forces are less efficient, less accurate, and less credible,

85. *Washington Journal* (German Language Weekly), October 23, 1964, p. 1.

than ICBMs. But if the Soviet Union is dedicated to offensive world objectives, the special effects of space-military offensive forces may appear very useful. Such effects are, for example, prestige, terror, persuasion, coercion, pressure, psychological warfare, and demoralization. The sight and electronic signals coming from Soviet military-orbital forces in the free skies of the world day and night, with communist satellite TV and propaganda tuned into Western sets around the world, would not be attractive to contemplate in view of the Soviet goals of worldwide communist domination.

Speaking at the annual meeting of the American Institute of Aeronautics and Astronautics at San Francisco on July 29, 1965, Dr. Albert C. Hall, Deputy Director for Space, Office of the Director of Defense Research and Engineering of the OSD, said, "We could no more go unprotected against the masters of space than we could dare go unarmed on land, sea or in the air."

Nevertheless, we are doing just that—going unprotected. The exceptional accomplishments of the GEMINI program and those expected of the APOLLO will not assure much military protection.



Chronology of Weapons-Grade Nuclear Materials Cutbacks

- December 1962 President Kennedy on the "overkill" thesis in the course of a radio-TV program, "There is just a limit to how much we need, as well as how much we can afford, to have a successful deterrent . . . I would say when we start to talk about the megatonnage we could bring into a nuclear war, we are talking about annihilation. How many times do you have to hit a target with nuclear weapons?" (*The New York Times*, January 5, 1962, p. 14.)
- November 1963 Oak Ridge Laboratory graphite reactor to be shut down in November after 20 years' operation. Dr. Linus Pauling puts U. S. nuclear arsenal at 240,000 megatons, U.S.S.R.'s at 80,000; says U. S. has 12 times stockpile needed to wipe out U.S.S.R. (*The New York Times*, September 29, 1963, p. 51.)
- January 1964 President Johnson, ordering cutbacks in manufacture of fissionable materials and manufacture of arms, urges U.S.S.R. do likewise as step toward "eventual abolition of arms," State of Union Message; suggests move is possible because building of arsenal is at point where it is becoming excessive; administration officials note arsenal has increased 50 percent in last 3 years, now includes tens of thousands of weapons; AEC sees cutback saving \$50-million in fiscal '65, \$70-million in next year. (*The New York Times*, January 9, 1964, p. 1.)
- January 1964 Two uranium-processing plants to close; operations at two others cut. (*The New York Times*, January 12, 1964, p. 33.)
- February 1964 U.S.S.R. Marshal Krylov holds U. S. stockpile exceeds needs. (*The New York Times*, February 23, 1964, p. 21.)
- June 1964 AEC stresses stockpile increases but at reduced rate, comment of President Johnson statement on cut. (*The New York Times*, August 21, 1964, p. 1.)
- December 1964 Seaborg reports AEC will cut outlays for production of fissionable material, news conference after conference with President Johnson. (*The New York Times*, December 31, 1964, p. 1.)

- January 1965 As part of the U. S. plan for curbing the spread of atomic weapons, William C. Foster, Director of the Arms Control and Disarmament Agency, said in February 1964, that the U. S. was "prepared to permit international inspection" of one of the four plutonium production reactors scheduled to be shut down by the U. S. Since then, two of the reactors have been shut down, one at Savannah River, S. C., summer of 1964, and one at Hanford, Wash., on January 2, 1965. The two remaining at Hanford were scheduled to be shut down in May and June of 1965, leaving the AEC with 10 reactors producing plutonium for atomic weapons. (*The New York Times*, January 11, 1965, p. 13.)
- February 1965 Excerpt from *AEC Authorizing Legislation—1966*, p. 1919. (Summary of operating programs Fiscal Year 1966) "... Production of special nuclear materials will decline somewhat in 1966 as a result of reduced cascade power and the first full year of operations after the shutdown of four production reactors during 1964 and 1965. Work will continue on process improvements to assure continuity and safety of operation and more economical methods of production Weapons program.—Operating costs for the weapons program are estimated at \$705.4-million in 1966 compared with 1965 estimated costs of \$753.3-million and 1964 actual costs of \$754.9-million. The weapons program encompasses the production of atomic weapons; the maintenance of stockpiled weapons in a state of constant readiness; the design, development, and underground testing of new weapons types; preparation for and maintenance of a readiness capability to resume atmospheric testing; and participating with the Department of Defense in the development of test detection methods."
- April 1965 President Johnson's comments on AEC program, April 17, 1965, letter to Chairman Seaborg, "The orderly cut-back in the production of fissionable materials is a significant example of this realism . . ." (*AEC Authorizing Legislation—1966*, p. 1886.)
- November 1965 AEC reports "no evidence" U.S.S.R. has carried out nuclear materials cutbacks announced April 20, 1964. This question has been raised by Senator Jackson. (*The New York Times*, November 25, 1965, p. 15.)
- January 1966 President Johnson's Budget Message puts AEC appropriations and estimated expenditures below Fiscal 1966 level; expenditures down \$90-million. (*The New York Times*, January 25, 1966, pp. 18, 22.)

January 1967

The Administration, in a budget-motivated gesture toward slowing the atomic arms race, announced today (January 24, 1967) a further cut-back in the production of fissionable materials for nuclear weapons. On July 1, 1967, AEC will shut down the plutonium production reactor at Hanford, Washington. This will be the fifth reactor closed since 1964. Senator Henry M. Jackson expressed concern over the decision "particularly in light of the substantial requirements that could develop if a decision is made to produce and deploy an anti missile system." Senator Jackson observed that the Soviet Union has been "expanding its output" of fissionable materials. (*The New York Times*, January 25, 1967, p. 9.)

